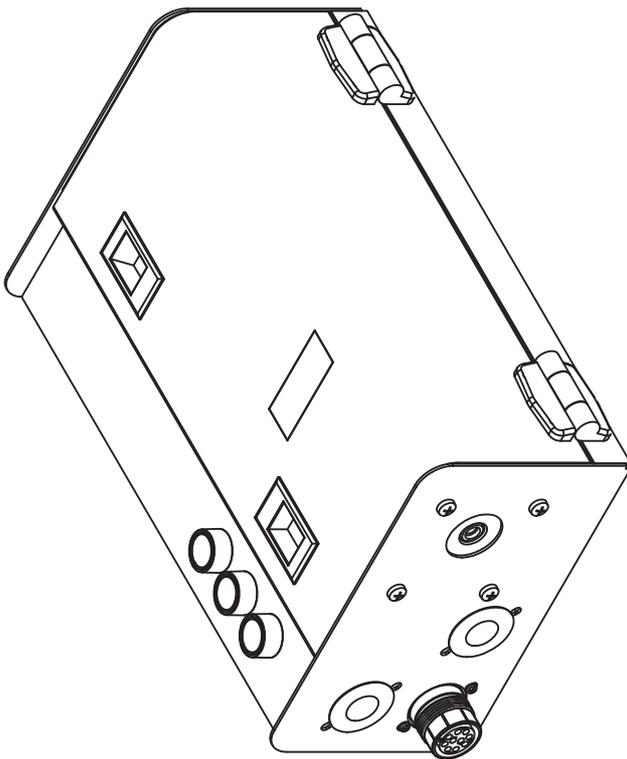


VR 1530 PD

Operating Instructions
Spare Parts List
Wirefeeder



42,0426,0009,EN 003-08112013

42,0426,0009,EN 012009

Dear Reader

Introduction

Thank you for choosing Fronius - and congratulations on your new, technically high-grade Fronius product! This instruction manual will help you get to know your new machine. Read the manual carefully and you will soon be familiar with all the many great features of your new Fronius product. This really is the best way to get the most out of all the advantages that your machine has to offer.

Please also take special note of the safety rules - and observe them! In this way, you will help to ensure more safety at your product location. And of course, if you treat your product carefully, this definitely helps to prolong its enduring quality and reliability - things which are both essential prerequisites for getting outstanding results.



Safety rules

DANGER!



“**DANGER!**” indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury. This signal word is to be limited to the most extreme situations. This signal word is not used for property damage hazards unless personal injury risk appropriate to this level is also involved.

WARNING!



“**WARNING!**” indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury. This signal word is not used for property damage hazards unless personal injury risk appropriate to this level is also involved.

CAUTION!



“**CAUTION!**” indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices that may cause property damage.

NOTE!



“**NOTE!**” indicates a situation which implies a risk of impaired welding result and damage to the equipment.

Important!

“**Important!**” indicates practical hints and other useful special-information. It is no signal word for a harmful or dangerous situation.

Whenever you see any of the symbols shown above, you must pay even closer attention to the contents of the manual!

General remarks



This equipment has been made in accordance with the state of the art and all recognised safety rules. Nevertheless, incorrect operation or misuse may still lead to danger for

- the life and well-being of the operator or of third parties,
- the equipment and other tangible assets belonging to the owner/operator,
- efficient working with the equipment.

All persons involved in any way with starting up, operating, servicing and maintaining the equipment must

- be suitably qualified
- know about welding and
- read and follow exactly the instructions given in this manual.

The instruction manual must be kept at the machine location at all times. In addition to the instruction manual, copies of both the generally applicable and the local accident prevention and environmental protection rules must be kept on hand, and of course observed in practice.

All the safety instructions and danger warnings on the machine itself:

- must be kept in a legible condition
- must not be damaged, must not be removed
- must not be covered, pasted or painted over

For information about where the safety instructions and danger warnings are located on the machine, please see the section of your machine's instruction manual headed “General remarks”.

General remarks
(continued)

Any malfunctions which might impair machine safety must be eliminated immediately - meaning before the equipment is next switched on.

It's your safety that's at stake!

Utilisation for intended purpose only



The machine may only be used for jobs as defined by the "Intended purpose".

The machine may ONLY be used for the welding processes stated on the rating plate.

Utilisation for any other purpose, or in any other manner, shall be deemed to be "not in accordance with the intended purpose". The manufacturer shall not be liable for any damage resulting from such improper use.

Utilisation in accordance with the "intended purpose" also comprises

- complete reading and following of all the instructions given in this manual
- complete reading and following of all the safety instructions and danger warnings
- performing all stipulated inspection and servicing work.

The appliance must never be used for the following:

- Thawing pipes
- Charging batteries/accumulators
- Starting engines

The machine is designed to be used in industrial and workshop environments. The manufacturer shall not be liable for any damage resulting from use of the machine in residential premises.

likewise the manufacturer will accept no liability for defective or faulty work results.

Ambient conditions



Operation or storage of the power source outside the stipulated range is deemed to be "not in accordance with the intended use". The manufacturer shall not be liable for any damage resulting herefrom.

Temperature range of ambient air:

- when operating: - 10 °C to + 40 °C (14 °F to 104 °F)
- when being transported or stored: - 20 °C to + 55 °C (-4 °F to 131 °F)

Relative atmospheric humidity:

- up to 50 % at 40 °C (104 °F)
- up to 90 % at 20 °C (68 °F)

Ambient air: Free of dust, acids, corrosive gases or substances etc.

Elevation above sea level: Up to 2000 m (6500 ft)

Obligations of owner/operator



The owner/operator undertakes to ensure that the only persons allowed to work with the machine are persons who

- are familiar with the basic regulations on workplace safety and accident prevention and who have been instructed in how to operate the machine
- have read and understood this operating manual particularly the sections on "Safety rules", and have confirmed as much with their signatures
- be trained in such a way that meets with the requirements of the work results

Regular checks must be performed to ensure that personnel are still working in a safety-conscious manner.

Obligations of personnel

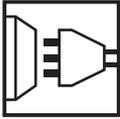


Before starting work, all persons to be entrusted with carrying out work with (or on) the machine shall undertake

- to observe the basic regulations on workplace safety and accident prevention
- to read this operating manual particularly the sections on “Safety rules” and to sign to confirm that they have understood these and will comply with them.

Before leaving the workplace, personnel must ensure that there is no risk of injury or damage being caused during their absence.

Mains connection



High-performance devices can affect the quality of the mains power due to their current-input.

This may affect a number of types of device in terms of:

- connection restrictions
- criteria with regard to maximum permissible mains impedance ^{*)}
- criteria with regard to minimum short-circuit power requirement ^{*)}

^{*)} at the interface with the public mains network

see Technical Data

In this case, the plant operator or the person using the device should check whether or not the device is allowed to be connected, where appropriate through discussion with the power supply company.

NOTE! Ensure that the mains connection is earthed properly.

Protection for yourself and other persons



When welding, you are exposed to many different hazards such as:

- flying sparks and hot metal particles
- arc radiation which could damage your eyes and skin
- harmful electromagnetic fields which may put the lives of cardiac pace-maker users at risk
- electrical hazards from mains and welding current
- increased exposure to noise
- noxious welding fumes and gases.

Anybody working on the workpiece during welding must wear suitable protective clothing with the following characteristics:

- flame-retardant
- isolating and dry
- must cover whole body, be undamaged and in good condition
- protective helmet
- trousers with no turn-ups

Protection for yourself and other persons
(continued)



“Protective clothing” also includes:

- protecting your eyes and face from UV rays, heat and flying sparks with an appropriate safety shield containing appropriate regulation filter glass
- wearing a pair of appropriate regulation goggles (with sideguards) behind the safety shield
- wearing stout footwear that will also insulate even in wet conditions
- protecting your hands by wearing appropriate gloves (electrically insulating, heat-proof)
- To lessen your exposure to noise and to protect your hearing against injury, wear ear-protectors!



Keep other people - especially children - well away from the equipment and the welding operation while this is in progress. If there are still any other persons nearby during welding, you must

- draw their attention to all the dangers (risk of being dazzled by the arc or injured by flying sparks, harmful welding fumes, high noise immission levels, possible hazards from mains or welding current ...)
- provide them with suitable protective equipment and/or
- erect suitable protective partitions or curtains.

Information on noise emission values



The device generates a maximum sound power level of <80 dB(A) (ref. 1pW) when idling and in the cooling phase following operation at the maximum permissible operating point under maximum rated load conditions according to EN 60974-1.

It is not possible to provide a workplace-related emission value during welding (or cutting) as this is influenced by both the process and the environment. All manner of different welding parameters come into play, including the welding process (MIG/MAG, TIG welding), the type of power selected (DC or AC), the power range, the type of weld metal, the resonance characteristics of the workpiece, the workplace environment, etc.

Hazards from noxious gases and vapours



The fumes given off during welding contain gases and vapors that are harmful to health.

Welding fumes contain substances which may cause birth defects and cancers.

Keep your head away from discharges of welding fumes and gases.

Do not inhale any fumes or noxious gases that are given off.
Extract all fumes and gases away from the workplace, using suitable means.

Ensure a sufficient supply of fresh air.

Where insufficient ventilation is available, use a respirator mask with an independent air supply.

If you are not sure whether your fume-extraction system is sufficiently powerful, compare the measured pollutant emission values with the permitted threshold limit values.

Close the shielding gas cylinder valve or central gas supply if no welding is taking place.

Hazards from noxious gases and vapours (continued)

The harmfulness of the welding fumes will depend on e.g. the following components:

- the metals used in and for the workpiece
- the electrodes
- coatings
- cleaning and degreasing agents and the like

For this reason, pay attention to the relevant Materials Safety Data Sheets and the information given by the manufacturer regarding the components listed above.

Keep all flammable vapors (e.g. from solvents) well away from the arc radiation.

Hazards from flying sparks



Flying sparks can cause fires and explosions!

Never perform welding anywhere near combustible materials.

Combustible materials must be at least 11 meters (36 ft. 1.07 in.) away from the arc, or else must be covered over with approved coverings.

Have a suitable, approved fire extinguisher at the ready.

Sparks and hot metal particles may also get into surrounding areas through small cracks and openings. Take suitable measures here to ensure that there is no risk of injury or fire.

Do not perform welding in locations that are at risk from fire and/or explosion, or in enclosed tanks, barrels or pipes, unless these latter have been prepared for welding in accordance with the relevant national and international standards.

Welding must NEVER be performed on containers that have had gases, fuels, mineral oils etc. stored in them. Even small traces of these substances left in the containers are a major explosion hazard.

Hazards from mains and welding current



An electric shock is potentially life-threatening, and can be fatal.

Do not touch any live parts, either inside or outside the machine.



In MIG/MAG and TIG welding, the welding wire, the wire spool, the drive rollers and all metal parts having contact with the welding wire are also live.

Always place the wirefeeder on an adequately insulated floor or base, or else use a suitable insulating wirefeeder holder.

Ensure sufficient protection for yourself and for other people by means of a dry base or cover that provides adequate insulation against the ground/frame potential. The base or cover must completely cover the entire area between your body and the ground/frame potential.

All cables and other leads must be firmly attached, undamaged, properly insulated and adequately dimensioned. Immediately replace any loose connections, scorched, damaged or underdimensioned cables or other leads.

Hazards from mains and welding current

(continued)

Do not loop any cables or other leads around your body or any part of your body.

Never immerse the welding electrode (rod electrode, tungsten electrode, welding wire, ...) in liquid in order to cool it, and never touch it when the power source is ON.

Twice the open-circuit voltage of one single welding machine may occur between the welding electrodes of two welding machines. Touching the potentials of both electrodes simultaneously may be fatal.

Have the mains and the machine supply leads checked regularly by a qualified electrician to ensure that the PE (protective earth) conductor is functioning correctly.

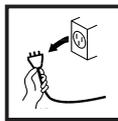
Only run the machine on a mains network with a PE conductor, and plugged into a power outlet socket with a protective-conductor contact.

If the machine is run on a mains network without a PE conductor and plugged into a power outlet socket without a protective-conductor contact, this counts as gross negligence and the manufacturer shall not be liable for any resulting damage.

Wherever necessary, use suitable measures to ensure that the workpiece is sufficiently grounded (earthed).

Switch off any appliances that are not in use.

Wear a safety harness if working at height.



Before doing any work on the machine, switch it off and unplug it from the mains.

Put up a clearly legible and easy-to-understand warning sign to stop anybody inadvertently plugging the machine back into the mains and switching it back on again.

After opening up the machine:

- discharge any components that may be storing an electrical charge
- ensure that all machine components are electrically dead.

If work needs to be performed on any live parts, there must be a second person on hand to immediately switch off the machine at the main switch in an emergency.

Stray welding currents



If the following instructions are ignored, stray welding currents may occur. These can cause:

- fires
- overheating of components that are connected to the workpiece
- destruction of PE conductors
- damage to the machine and other electrical equipment

Ensure that the workpiece clamp is tightly connected to the workpiece.

Attach the workpiece clamp as close as possible to the area to be welded.

On electrically conductive floors, the machine must be set up in such a way that it is sufficiently insulated from the floor.

Stray welding currents

(continued)

When using current supply distributors, twin head wire feeder fixtures etc., please note the following: The electrode on the unused welding torch/ welding tongs is also current carrying. Please ensure that there is sufficient insulating storage for the unused welding torch/tongs.

In the case of automated MIG/MAG applications, ensure that only insulated filler wire is routed from the welding wire drum, large wirefeeder spool or wirepool to the wirefeeder.

EMC device classifications



Devices with emission class A:

- are only designed for use in an industrial setting
- can cause conducted and emitted interference in other areas.

Devices with emission class B:

- satisfy the emissions criteria for residential and industrial areas. This also applies to residential areas in which power is supplied from the public low-voltage grid.

EMC device classification as per the rating plate or technical specifications

EMC measures



In certain cases, even though a device complies with the standard limit values for emissions, it may affect the application area for which it was designed (e.g. when there is sensitive equipment at the same location, or if the site where the device is installed is close to either radio or television receivers).

If this is the case, then the operator is obliged to take appropriate action to rectify the situation.

Examine and evaluate any possible electromagnetic problems that may occur on equipment in the vicinity, and the degree of immunity of this equipment, in accordance with national and international regulations:

- safety features
- mains, signal and data-transmission leads
- IT and telecoms equipment
- measurement and calibration devices

Ancillary measures for preventing EMC problems:

a) Mains supply

- If electromagnetic interference still occurs, despite the fact that the mains connection is in accordance with the regulations, take additional measures (e.g. use a suitable mains filter).

b) Welding cables

- Keep these as short as possible
- Arrange them so that they run close together (to prevent EMI problems as well)
- Lay them well away from other leads.

c) Equipotential bonding

d) Workpiece grounding (earthing)

- where necessary, run the connection to ground (earth) via suitable capacitors.

e) Shielding, where necessary

- Shield other equipment in the vicinity
- Shield the entire welding installation.

EMI Precautions



Electromagnetic fields may cause as yet unknown damage to health.

- Effects on the health of persons in the vicinity, e.g. users of heart pace-makers and hearing aids
- Users of heart pacemakers must take medical advice before going anywhere near welding equipment or welding workplaces
- Keep as much space as possible between welding cables and head/body of welder for safety reasons
- Do not carry welding cables and hose pack over shoulder and do not loop around body or any part of body

Particular danger spots



Keep your hands, hair, clothing and tools well away from all moving parts, e.g.:

- fans
- toothed wheels, rollers, shafts
- wire-spools and welding wires

Do not put your fingers anywhere near the rotating toothed wheels of the wirefeed drive.

Covers and sideguards may only be opened or removed for as long as is absolutely necessary to carry out maintenance and repair work.

While the machine is in use:

- ensure that all the covers are closed and that all the sideguards are properly mounted ...
- ... and that all covers and sideguards are kept closed.



When the welding wire emerges from the torch, there is a high risk of injury (the wire may pierce the welder's hand, injure his face and eyes ...).



For this reason, when feeder-inching etc., always hold the torch so that it is pointing away from your body (machines with wirefeeder) and wear suitable protective goggles.



Do not touch the workpiece during and after welding - risk of injury from burning!

Slag may suddenly "jump" off workpieces as they cool. For this reason, continue to wear the regulation protective gear, and to ensure that other persons are suitably protected, when doing post-weld finishing on workpieces.

Allow welding torches - and other items of equipment that are used at high operating temperatures - to cool down before doing any work on them.



Special regulations apply to rooms at risk from fire and/or explosion. Observe all relevant national and international regulations.



Power sources for use in spaces with increased electrical danger (e.g. boilers) must be identified by the  (for "safety") mark. However, the power source should not be in such rooms.

Particular danger spots
(continued)



Risk of scalding from accidental discharge of hot coolant. Before unplugging the connectors for coolant forward flow and return flow, switch off the cooling unit.



Observe the information on the coolant safety data sheet when handling coolant. The coolant safety data sheet may be obtained from your service centre or downloaded from the manufacturer's website.

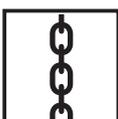


When hoisting the machines by crane, only use suitable manufacturer-supplied lifting devices.

- Attach the chains and/or ropes to **all** the hoisting points provided on the suitable lifting device.
- The chains and/or ropes must be at an angle which is as close to the vertical as possible.
- Remove the gas cylinder and the wirefeed unit (from MIG/MAG and TIG units).

When hoisting the wirefeed unit by crane during welding, always use a suitable, insulating suspension arrangement (MIG/MAG and TIG units).

If a machine is fitted with a carrying strap or carrying handle, remember that this strap is **ONLY** to be used for lifting and carrying the machine by hand. The carrying strap is **NOT** suitable for transporting the machine by crane, fork-lift truck or by any other mechanical hoisting device.

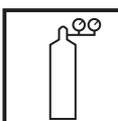


All lifting accessories (straps, handles, chains, etc.) used in connection with the device or its components must be tested regularly (e.g. for mechanical damage, corrosion or changes caused by other environmental factors). The testing interval and scope of testing must comply with applicable national standards and directives as a minimum.



Danger of colourless and odourless inert gas escaping unnoticed, when using an adapter for the inert gas protection. Seal the adapter thread for the inert gas connection using Teflon tape before assembly.

Factors affecting welding results



The following requirements with regard to shielding gas quality must be met if the welding system is to operate in a correct and safe manner:

- Size of solid matter particles <math><40\mu\text{m}</math>
- Pressure dew point <math><-20^\circ\text{C}</math>
- Max. oil content <math><25\text{mg}/\text{m}^3</math>

Filters must be used if necessary.



NOTE! There is an increased risk of soiling if ring mains are being used

Danger from shielding-gas cylinders



Shielding-gas cylinders contain pressurized gas and may explode if they are damaged. As shielding-gas cylinders are an integral part of the overall welding outfit, they also have to be treated with great care.

Protect shielding-gas cylinders containing compressed gas from excessive heat, mechanical impact, slag, naked flames, sparks and arcs.

Mount the shielding-gas cylinders in the vertical and fasten them in such a way that they cannot fall over (i.e. as shown in the instruction manual).

Keep shielding-gas cylinders well away from welding circuits (and, indeed, from any other electrical circuits).

Never hang a welding torch on a shielding-gas cylinder.

Never touch a shielding-gas cylinder with a welding electrode.

Explosion hazard - never perform welding on a pressurized shielding-gas cylinder.

Use only shielding-gas cylinders that are suitable for the application in question, together with matching, suitable accessories (pressure regulators, hoses and fittings, ...). Only use shielding-gas cylinders and accessories that are in good condition.

When opening the valve of a shielding-gas cylinder, always turn your face away from the outlet nozzle.

Close the shielding-gas cylinder valve when no welding is being carried out.

When the shielding-gas cylinder is not connected up, leave the cap in place on the shielding-gas cylinder valve.

Observe the manufacturer's instructions and all relevant national and international rules applying to shielding-gas cylinders and accessories.

Safety precautions at the installation site and when being transported



A machine that topples over can easily kill someone! For this reason, always place the machine on an even, firm floor in such a way that it stands firmly.
- An angle of inclination of up to 10° is permissible.



Special regulations apply to rooms at risk from fire and/or explosion. Observe all relevant national and international regulations.

By means of internal instructions and checks, ensure that the workplace and the area around it are always kept clean and tidy.

The appliance must only be installed and operated in accordance with the protection type stated on the specifications plate.

When installing the appliance, please ensure a clearance radius of 0.5 m (1.6ft.) , so that cool air can circulate freely.

When transporting the appliance, please ensure that the valid national and regional guidelines and accident protection regulations are followed. This applies in particular to guidelines in respect of dangers during transportation and carriage.

Safety precautions at the installation site and when being transported
(continued)

Before transportation, completely drain any coolant and dismantle the following components:

- Wire feed
- Wire wound coil
- Gas bottle

Before commissioning and after transportation, a visual check for damage must be carried out. Any damage must be repaired by trained service personnel before commissioning.

Safety precautions in normal operation



Only operate the machine if all of its protective features are fully functional. If any of the protective features are not fully functional, this endangers:

- the life and well-being of the operator or other persons
- the equipment and other tangible assets belonging to the owner/operator
- efficient working with the equipment.

Any safety devices that are not fully functional must be put right before you switch on the machine.

Never evade safety features and never put safety features out of order.

Before switching on the machine, ensure that nobody can be endangered by your doing so.

- At least once a week, check the machine for any damage that may be visible from the outside, and check that the safety features all function correctly.
- Always fasten the shielding-gas cylinder firmly, and remove it altogether before hoisting the machine by crane.
- Owing to its special properties (in terms of electrical conductivity, frost-proofing, materials-compatibility, combustibility etc.), only original coolant of the manufacturer is suitable for use in our machines.
- Only use suitable original coolant of the manufacturer.
- Do not mix original coolant of the manufacturer with other coolants.
- If any damage occurs in cases where other coolants have been used, the manufacturer shall not be liable for any such damage, and all warranty claims shall be null and void.
- Under certain conditions, the coolant is flammable. Only transport the coolant in closed original containers, and keep it away from sources of ignition.
- Used coolant must be disposed of properly in accordance with the relevant national and international regulations. A safety data sheet is available from your service centre and on the manufacturer's homepage.
- Before starting welding - while the machine is still cool - check the coolant level.

Preventive and corrective maintenance



With parts sourced from other suppliers, there is no certainty that these parts will have been designed and manufactured to cope with the stressing and safety requirements that will be made of them. Use only original spares and wearing parts (this also applies to standard parts).

Do not make any alterations, installations or modifications to the machine without getting permission from the manufacturer first.

Replace immediately any components that are not in perfect condition.

When ordering spare parts, please state the exact designation and the relevant part number, as given in the spare parts list. Please also quote the serial number of your machine.

Safety inspection



The manufacturer recommends that a safety inspection of the device is performed at least once every 12 months.

The manufacturer recommends that the power source be calibrated during the same 12-month period.

A safety inspection should be carried out by a qualified electrician

- after any changes are made
- after any additional parts are installed, or after any conversions
- after repair, care and maintenance has been carried out
- at least every twelve months.

For safety inspections, follow the appropriate national and international standards and directives.

Further details on safety inspection and calibration can be obtained from your service centre. They will provide you on request with any documents you may require.

Disposal



Do not dispose of this device with normal domestic waste!

To comply with the European Directive 2002/96/EC on Waste Electrical and Electronic Equipment and its implementation as national law, electrical equipment that has reached the end of its life must be collected separately and returned to an approved recycling facility. Any device that you no longer require must be returned to our agent, or find out about the approved collection and recycling facilities in your area.

Ignoring this European Directive may have potentially adverse effects on the environment and your health!

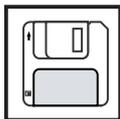
Safety markings



Equipment with CE-markings fulfils the basic requirements of the Low-Voltage and Electromagnetic Compatibility Guideline (e.g. relevant product standards according to EN 60 974).



Equipment marked with the CSA-Test Mark fulfils the requirements made in the relevant standards for Canada and the USA.

Data security

The user is responsible for the data security of changes made to factory settings. The manufacturer is not liable, if personal settings are deleted.

Copyright

Copyright to this instruction manual remains the property of the manufacturer.

The text and illustrations are all technically correct at the time of going to print. The right to effect modifications is reserved. The contents of the instruction manual shall not provide the basis for any claims whatever on the part of the purchaser. If you have any suggestions for improvement, or can point out to us any mistakes which you may have found in the manual, we should be most grateful for your comments.

Contents

VR 1530 PD	3
Safety	3
Machine concept	3
Areas of use	3
Directive efficiency of the VR 1530 PD	4
System requirements	5
Application example	5
Overview	6
Warning notices affixed to the machine	6
Controls and connections	7
General	7
VR 1530 PD - View wire feed	7
VR 1530 PD - View wire outlet	8
VR 1530 PD - side view	8
Procedure when pushing the Wire Feed button for a long time	9
Initial operation	10
Safety	10
Designated Use	10
Set-up requirements	10
Room for swivelling up the wire feed lid	10
Fitting drill holes	11
Fitting the wire feed hose to the VR 1500	12
Safety	12
Fastening the wire feed hose to the VR 1500	13
Check the distance	13
Distance of 2 mm (0.08 in.) is not achieved	15
Set distance	16
Fitting wire feed hose from the welding wire drum or from the large spool	18
Safety	18
Fastening wire feed hose	18
Replacing wire guide nozzles	19
Safety	19
Tools required	19
Accessories	19
Preparation	19
Unscrewing the planetary head	20
O-ring seal and cup spring	20
Removing the wire guide nozzles	20
Fitting the wire guide nozzles	21
Positioning the O-ring seal and cup spring	21
Tightening the planetary head	21
Follow up work	22
Setting contact pressure	22
Safety	22
Disengaging the planetary head	22
Setting pressure spring to correct contact pressure	23
Engaging the planetary drive	24
Threading welding wire in	24
Insulated routing of welding wire to wirefeeder	24
Safety	25
Preparation	25
Disengaging the planetary head	25
Threading welding wire in	26
Engaging the planetary drive	27

Replacing feed rollers	28
Safety	28
General	28
Tools required	28
Preparation	28
Detaching the planetary head	29
Removing the spacer and the inlet nozzle	29
Disassembling the planetary head	29
Taking off the rocking lever arbors	29
Removing the mounts for wire feed rollers	30
Dismantling the wire feed rollers	30
Installing the wire feed rollers	30
Installing the mounts for wire feed rollers	31
Installing the rocking lever arbors	31
Assembling the planetary head	32
Inserting the spacer and the inlet nozzle	32
Mounting the planetary head	32
Follow up work	32
Push-pull unit	33
General remarks	33
Push-pull unit selection	33
Push-pull alignment	33
Service codes for push-pull alignment	35
Safety	35
Error codes shown when the drive units are disengaged (“open-circuit” alignment)	35
Error codes shown when the drive units are engaged (“engaged” alignment)	36
Troubleshooting	38
General remarks	38
VR 1530 PD error diagnosis	38
Care, maintenance and disposal	40
General remarks	40
Every time before starting to use the VR 1530 PD	40
Disposal	40
Technical data	40
VR 1530 PD	40
Wiring diagram	
Spare Parts Lists	
Fronius Worldwide	

VR 1530 PD

Safety



WARNING! Incorrect operation can cause serious personal injury and damage to property. Before initial operation of the VR 1530 PD you must have read and understood the following documents completely:

- The Operating Manual VR 1530 PD
- The power source operating manual, in particular the chapter „Safety Regulations“.



CAUTION! Risk of injury from rotating parts. Only operate the VR 1530 PD with the lid closed. Only thread the wire in or rewind it using the button(s) when the lid is closed.



CAUTION! Risk of injury when the lid is open for maintenance or setting up. Ensure that the rotating drive parts of the VR 1530 PD can not be started by pushing the feeder inching button(s) on the operating panel, on the VR 1530 PD itself or on other system extensions.

Machine concept

The VR 1530 PD is an unwinding-wire feed, which has been designed specially for automatic and robotic operation for welding steel, CrNi and CuSi wires. The VR 1530 PD is highly suited for applications in which exact wire feed and exact wire direction are required. This is necessary in particular for unwinding wires from a welding wire drum or a large spool. The VR 1530 PD is used as an additional drive unit between the welding wire drum or the large spool and the variation of the VR 1500 used in order to achieve exceptionally constant wire feed for very long hosepacks as well.

Two precision rollers fitted at an angle of 90° to one another produce a large surface contact to the welding wire. Thanks to the large surface load transmission this leads to outstanding wire feed even for very soft CuSi-wires and very long hosepacks. The additional drive and directive efficiency of the VR 1530 PD have a positive influence on the availability of the whole system.

Areas of use

The good wire feed properties and the excellent directive efficiency open up a very varied field of application to the VR 1530 PD. The VR 1530 PD is particularly suitable for applications that require an exact directive function in addition to exact wire feed. All applications in which a conventional wire directive system has no effect are also seen as fields of application.

The unwinding-wire feed VR 1530 PD is particularly suitable for applications with the following requirements:

- Welding wire-drum, large spool
(steel, CuSi, CRNi)
- High welding speed
(process „Time TWIN Digital“, process „LaserHybrid“, ...)
- High speed
(small a-dimension, resistance lap seams, ...)

Directive efficiency of the VR 1530 PD

If the wire is taken from the welding wire drum or the large spool, it has a certain curve (discontinuity dimension) and torsion (twist). Amongst other things it is the task of the VR 1530 PD to balance out the discontinuity dimension, as well as the twist if possible (directive efficiency).

Discontinuity dimension and twist are explained in more detail in the following:

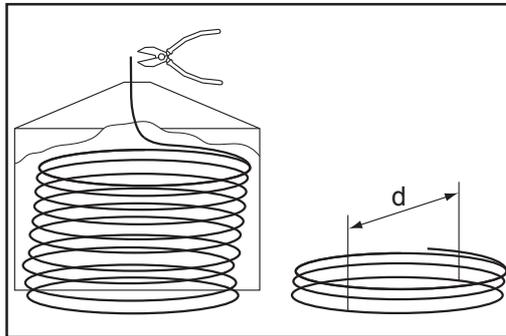


Fig.1 Discontinuity dimension

Discontinuity dimension

A dimension for the welding wire curve is the discontinuity dimension. If the welding wire has been removed from the welding wire drum or large spool without being aligned, the discontinuity dimension corresponds to the diameter (d) of the resulting circle.

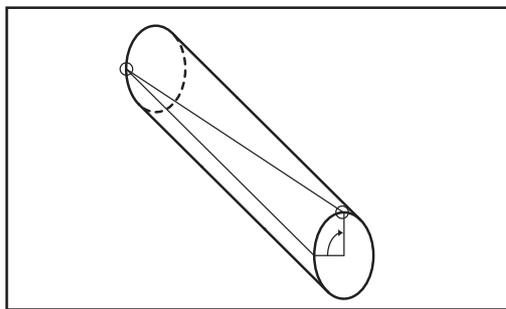


Fig.2 Twist

Twist

The wire torsion when removed from the welding wire drum or large spool without alignment is described as twist.

Practical effect of tempering and twist

The following illustrations show a comparison of the effects of tempering and twist with and without VR 1530 PD, when using a welding wire drum or a large spool.

Without VR 1530 PD:

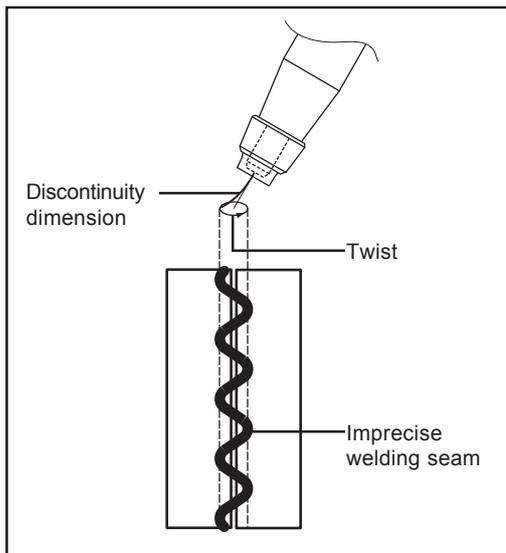


Fig.3 Effect when wire alignment is missing

With VR 1530 PD:

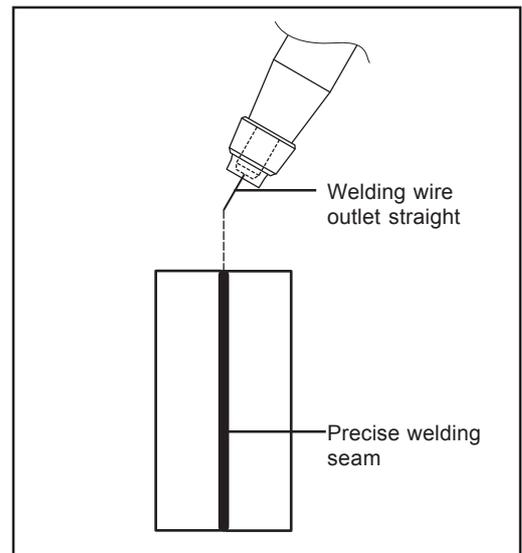


Fig.4 Exact welding seam during wire alignment

System requirements

Important! The following positions listed refer to the illustration in the chapter „Application Example“ and each apply for one wire feeder or one power source in the system.

System requirements for integrating the VR 1530 PD:

- (3) Power source with
 - Firmware UST 3.10.22 or higher
 - Software FS-Drive
 - Conversion kit reinforced motor supply 55V/8A
- (6) 1 wire feed hose (from wire drum or from the large spool to the VR 1530 PD)
- (7) 1 wire feed hose (from VR 1530 PD to the VR 1500)
- (11) Variant of the wire feeder VR 1500 (main wire feeder with central torch connection)
 - Firmware SR41 1.70.16 or higher
 - Conversion kit PMR4000 PullMig TS/TPS 2700-5000
 - Kit VR 1500 - Unwinding-VR
- (12) Connecting cable VR 1500

Application example

The following application example shows VR 1530 PD in a application using an industrial robot and with the high performance two-wire process TimeTWIN Digital.

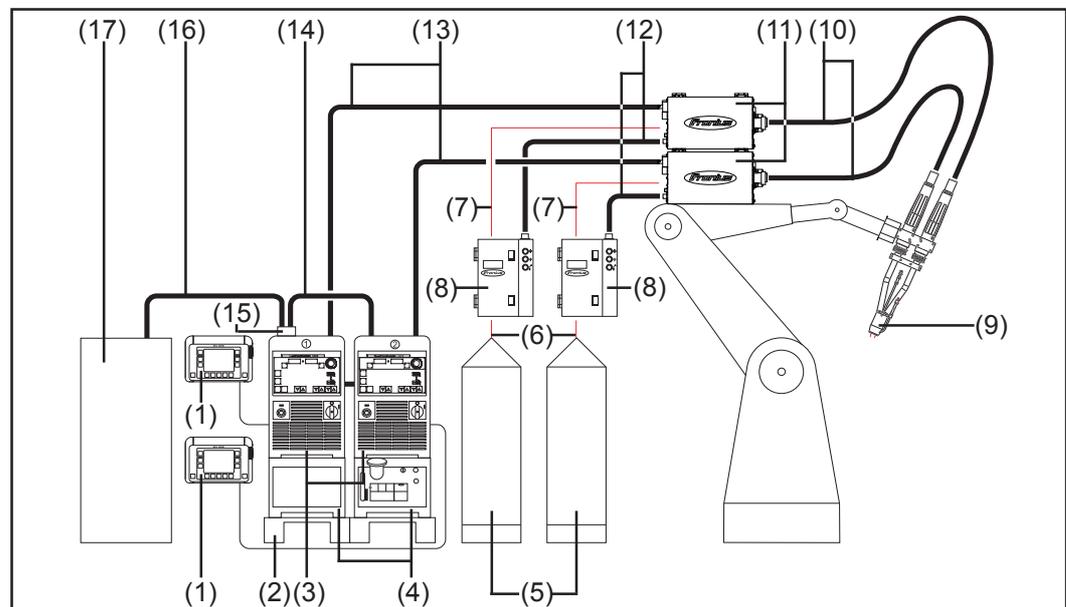


Fig.5 Example of application for the VR 1530 PD using the „TimeTWIN digital“ process

- (1) Remote operating panel RCU 5000i (2x)
- (2) Standing control desk (2x, screwed)
- (3) 2 power sources TPS 5000, with
 - LHSB-connection (2x)
 - LHSB-connecting cable (1x)
 - Software release (2x)
 - Software update from the Fronius database (2x)
 - Reinforced motor supply 55 V / 8 A (2x)
- (4) Cooling device FK 9000 R (1x, part 1 and part 2)
- (5) Welding wire drum (2x)
- (6) Wire feed hoses (2x, to the VR 1530 PD)
- (7) 2 wire feed hoses (2x, from VR 1530 PD to the VR 1500)
- (8) Unwinding feed VR 1530 PD (2x)
- (9) Robacta Twin 900 welding torch
- (10) Welding torch hosepack Robacta Twin
- (11) Robotic feeds VR 1500 (2x)
 - Kit VR 1500 - Unwinding-VR
 - Conversion kit PMR4000 PullMig
- (12) Connecting cable VR 1500 (2x)
- (13) Standard connecting hosepack (2x)
- (14) LocalNet connecting cable between the power sources
- (15) Robotic interface Twin DeviceNet field bus (on one power source)
- (16) Field bus
- (17) Robot control

Overview

The unwinding wire feeder VR 1530 PD can be operated using the following power sources:

Digital power sources:

- Trans (Puls) Synergic 4000
- Trans (Puls) Synergic 5000
- Trans (Puls) Synergic 7200 (parallel operation of two Trans(Puls) Synergic)
- Trans (Puls) Synergic 9000 (parallel operation of two Trans(Puls) Synergic)
- „TimeTWIN digital“ process

Warning notices affixed to the machine

The wire feeder comes with extra warning labels affixed to the unit. The warning labels must NOT be removed or painted over. The symbols warn against incorrect operation. Incorrect operation can cause serious personal injury and damage to property.

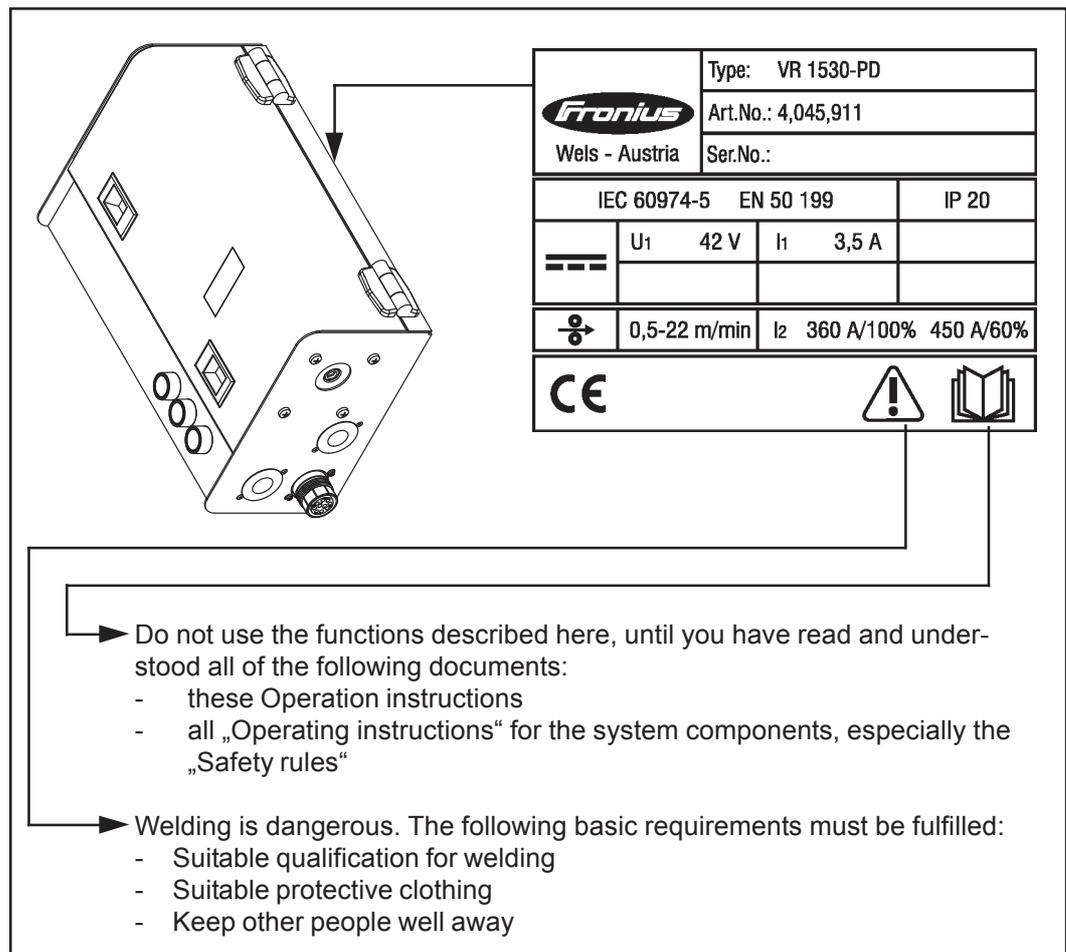


Fig.5a Warning notices affixed to the wire feeder

Controls and connections

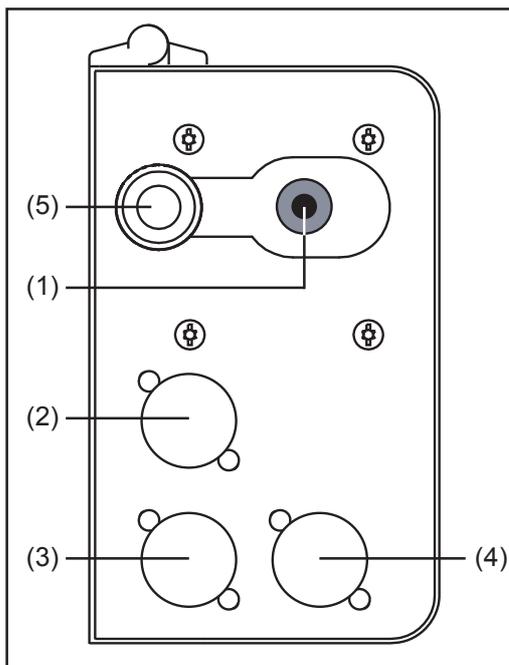
General



WARNING! Incorrect operation can cause serious personal injury and damage to property. Only use the functions described when the operating instructions for the wire feeders, as well as the operating instructions for the power source have been read and understood completely.



VR 1530 PD - View wire feed



- (1) **Wire feed hose mount** ... for mounting the wire feed hose from the welding wire drum or the large spool
- (2) **Blind cover**
- (3) **Option wire end check**, otherwise blind cover
- (4) **Blind cover**
- (5) **Positioning screw**

Fig.6 View wire feed

**VR 1530 PD -
View wire outlet**

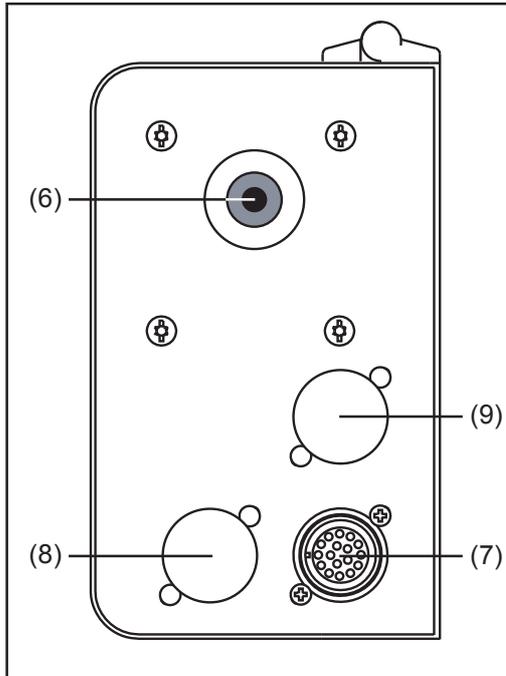


Fig.7 View wire outlet

- (6) **Wire feed hose mount ...**
for mounting the wire feed hose to the main wire feeder (with central torch connection)
- (7) **Connection socket VR 1500 ...**
17-pole connection socket for triggering and supplying the VR 1530 PD as per the circuit diagram
- (8) **Blind cover**
- (9) **Option Interface VR 1530 PD, if available, otherwise blind cover**

The option Interface VR 1530 PD provides four customer specific lines via the VR 1500 (e.g. for connection of a wire speed sensor).

VR 1530 PD - side view

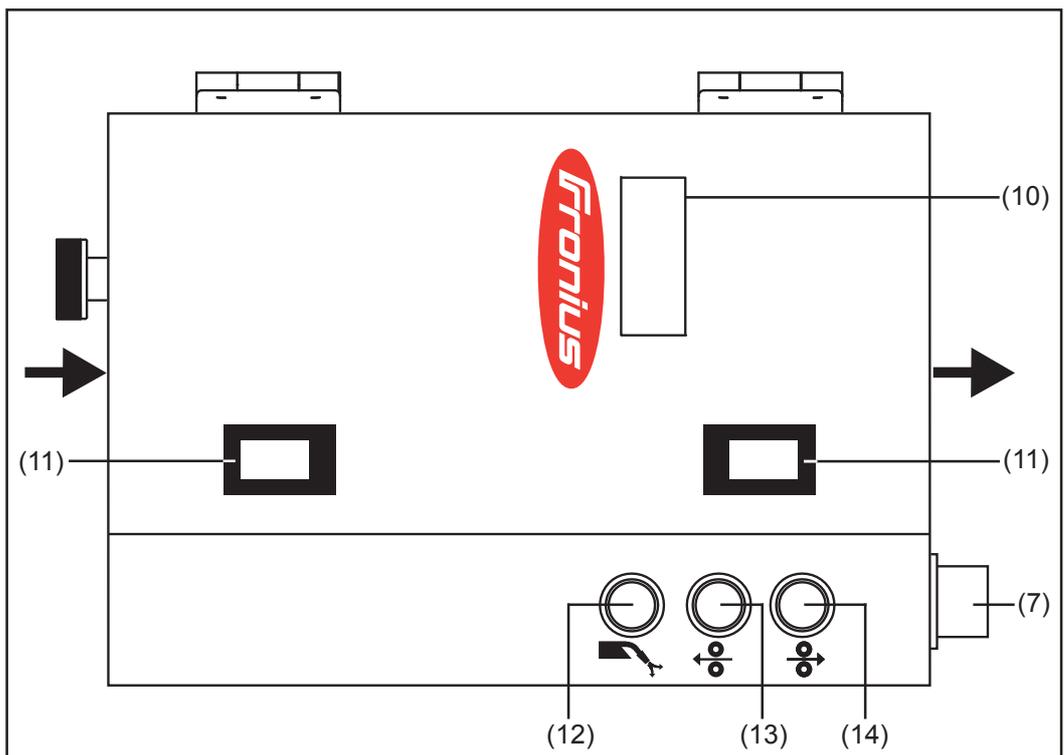


Fig.8 Side view

- (10) **Viewing window ...**
for monitoring the wire feed
- (11) **Unlocking handles ...**
push each unlocking handle inside to open the wire feed lid



VR 1530 PD - side view
(continued)



NOTE! When closing the wire feed lid ensure that the wire feed lid clicks in place audibly.

Failure to follow this information

- will lead to the safety cutoff being triggered at the start of welding
- The power source display shows the Service-Code Err | 056
- To cancel Err | 056: Close the lid tightly and push the Error button on the power source operating panel



CAUTION! Risk of injury from rotating parts. Contrary to actual operation wire feed also functions with the lid open. When carrying out work on the VR 1530 PD case, care must be taken that the rotating drive parts of the VR 1530 PD can not be started by pushing the 'Wire Threading button(s) on the operating panel, on the PT-drive itself, or on other system extensions.

(12) Gas Testing button...

For setting the required gas quantity on the pressure release valve. As long as the Gas Testing button is pressed, gas flows out.

(13) Wire Return button...

for returning the welding wire without gas and power. As long as the Wire Return button is pressed, the welding wire is returned.

(14) Wire Feed button...

for threading the welding wire without gas and power. As long as the Wire Feed button is pressed, the welding wire is threaded in.

Procedure when pushing the Wire Feed button for a long time

The procedure described in the following results when the Wire Feed is pushed and held down, this enables exact positioning of the welding wire.

Important! The procedure described does not apply for the Wire Return button.



CAUTION! Risk of injury from rotating parts. Only thread the wire in or rewind it using the button(s) when the lid is closed.



CAUTION! Risk of injury when the lid is open for maintenance or setting up. Ensure that the rotating drive parts of the VR 1530 PD can not be started by pushing the feeder inching button(s) on the operating panel, on the VR 1530 PD itself or on other system extensions.

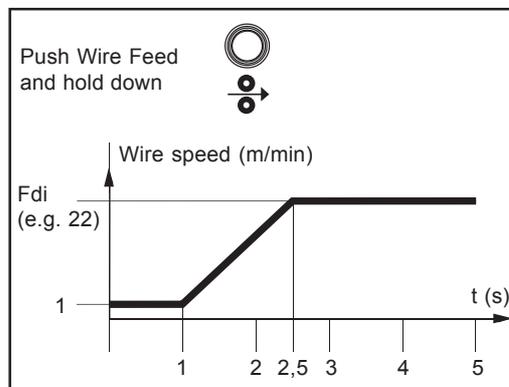


Fig.9 March of time for the wire speed when the Wire Feed button is pushed and held down

- Hold the button up to **one second** ... The threading speed in the first second remains at 1 m/min independently from the value set
- Hold the button up to **2.5 seconds** ... After one second the threading speed increases evenly during the next 1.5 seconds
- Holding the button **longer than 2.5 seconds** ... Constant wire feed takes place after a total of 2.5 seconds as per the wire speed set for the parameter Fdi.



Initial operation

Safety



WARNING! Incorrect handling and work that is carried out incorrectly can cause serious personal injury and damage to property.
- Before starting read the „Safety Regulations“ chapter

Designated Use

The VR 1530 PR wire feed is exclusively for MIG/MAG welding within the framework of a suitable plant configuration.

Any other form of use is deemed as not in accordance with the intended purpose. The manufacturer is not liable for any damage arising from this.

„Intended use“ also comprises:

- Following all the instructions given in this manual
- Performing all stipulated inspection and maintenance work

Set-up requirements



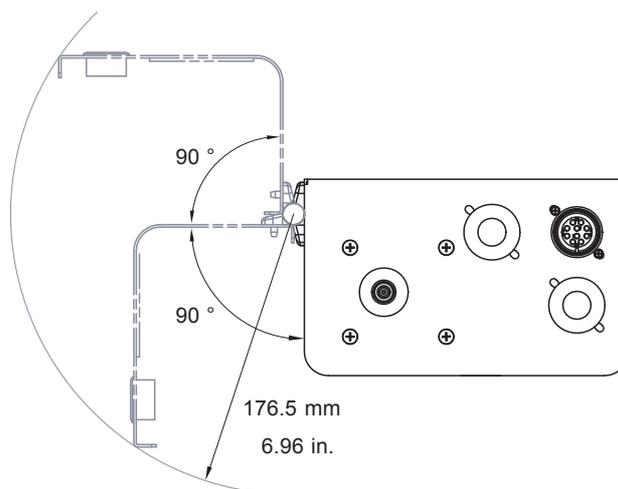
WARNING! An electric shock can be fatal. If you do not use the optional VR 1500 adapter plate, the wirefeeder must be mounted in such a way that it is insulated from earth.

Two positions are provided for mounting the wire feeder:

- **Position 1:** Assembly on the bottom plate of the VR 1530 PD
- **Position 2:** Assembly on the side of the VR 1530 PD

Room for swivelling up the wire feed lid

Taking the following room into consideration for swivelling up the wire feed lid when fitting the VR 1530 PD:



Fitting drill holes

Position 1: Hole pattern on the bottom plate of the VR 1530 PD

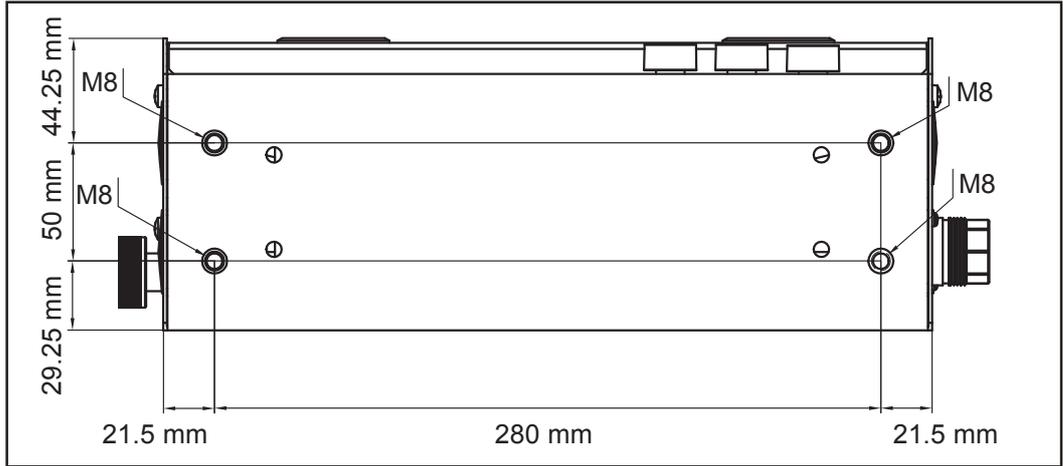


Fig.10 Hole pattern - fitting position 1 (mm)

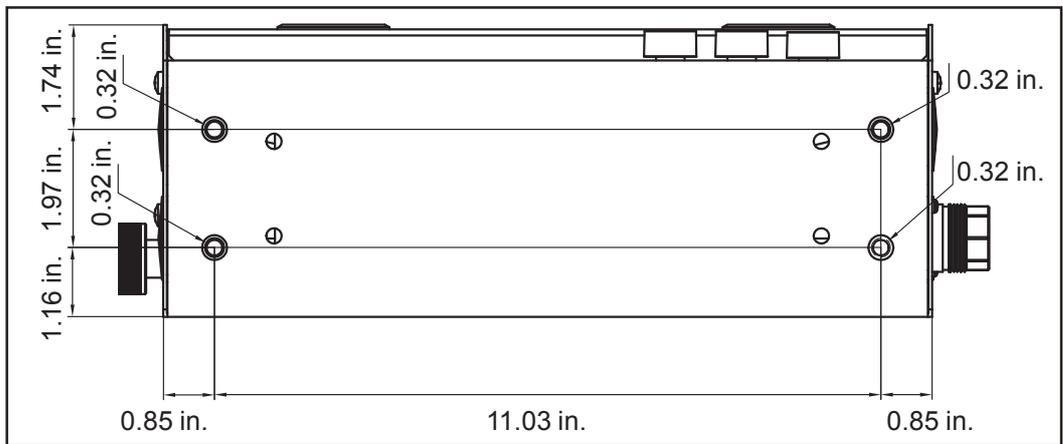


Fig.11 Hole pattern - fitting position 1 (in.)

Position 2: Hole pattern on the side of the VR 1530 PD

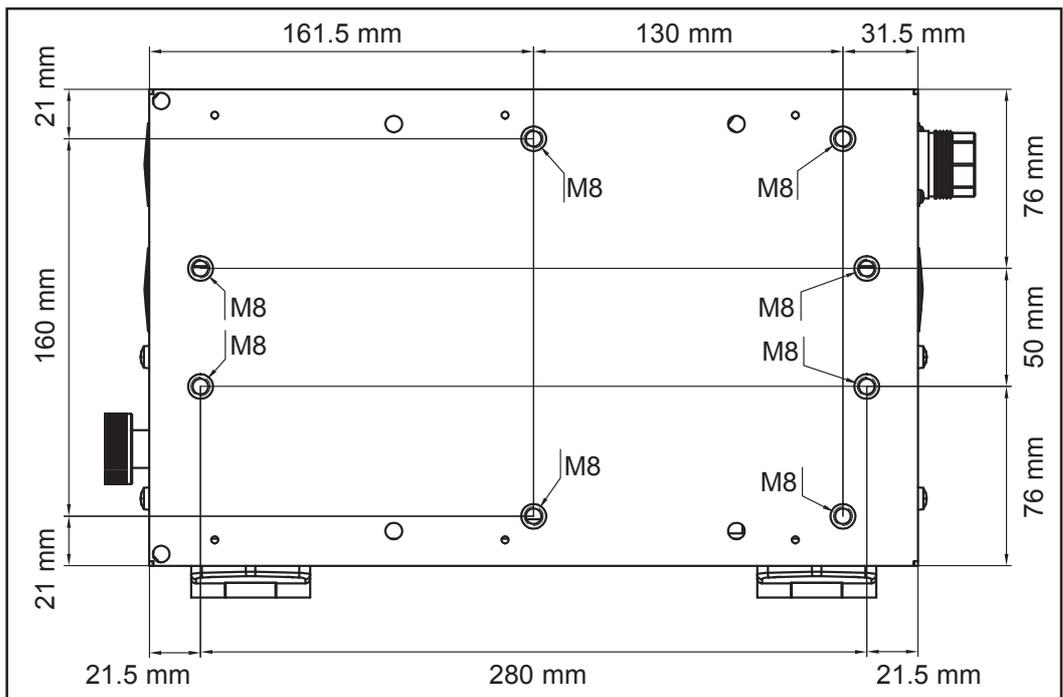


Fig.12 Hole pattern - fitting position 2 (mm)

Fitting drill holes (continued)

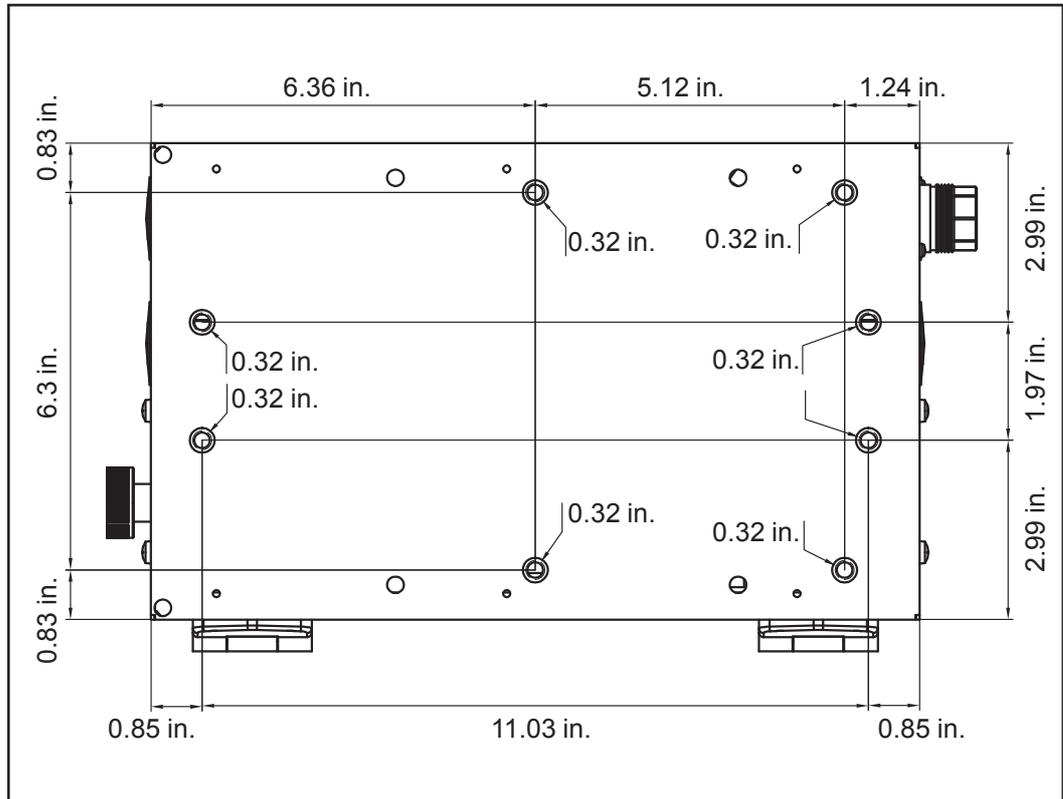


Fig.13 Hole pattern - fitting position 2 (in.)

Fitting the wire feed hose to the VR 1500

Safety



WARNING! Work that is carried out incorrectly can cause serious personal injury and damage to property.

- Before starting read the „Safety Regulations“ chapter



CAUTION! Risk of injury from rotating parts. Only thread the wire in or rewind it using the button(s) when the lid is closed.



CAUTION! Risk of injury when the lid is open for maintenance or setting up. Ensure that the rotating drive parts of the VR 1530 PD can not be started by pushing the feeder inching button(s) on the operating panel, on the VR 1530 PD itself or on other system extensions.

Fastening the wire feed hose to the VR 1500

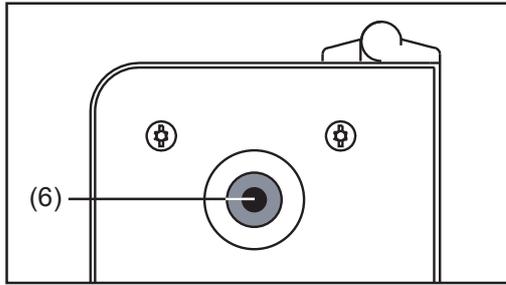


Fig.14 Push the wire feed hose in

Wire feed hose that leads to the VR 1500:

- Open wire feed lid
- Push wire feed hose (15) - Fig. 15 - with the wire feed nozzle into the mount (6) - Fig. 14.

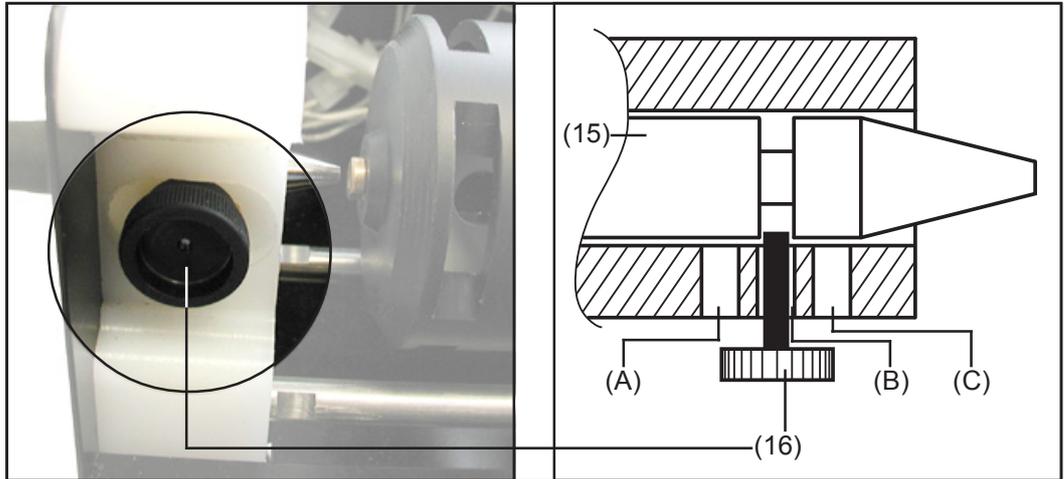


Fig.15 Fix the wire feed hose in place

- Slacken knurled screw (16)
- Insert knurled screw (16) in a centre position (B)

Important! The remaining positions (A) and (C) apply for special wire feed hoses with specially dimensioned wire feed nozzles.

- Screw knurled screw (16) in slightly
- Position wire feed hose (15), so that the knurled screw (16) audibly clicks in place in the notch on the brass piece on the wire feed hose
- Fasten the wire feed hose using the knurled screw (16)

Check the distance

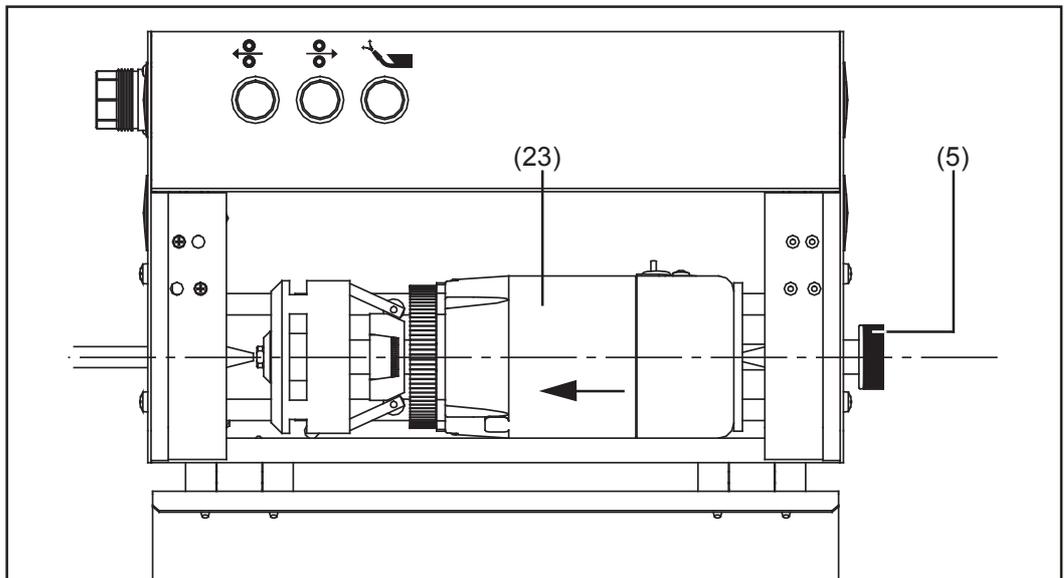
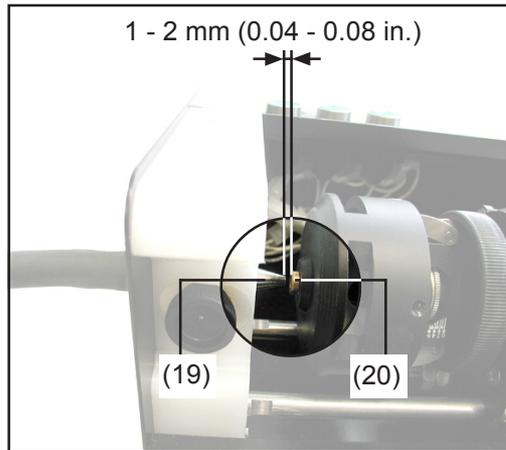


Fig.16 Push the drive unit to the left as far as the stop



Check the distance
(continued)

Push the drive unit (23) to the left as far as the stop (Fig. 16) by turning the positioning screw (5).



- Check that the outlet nozzle (20) is approx. 1 - 2 mm (0.04 - 0.08 in.) away from the nozzle (19) on the wire feed hose

Is the distance of approx. 1 - 2 mm (0.04 - 0.08 in.) correct:

- Close the wire feed lid
- If the distance is more than the range of approx. 1 - 2 mm:
- Then proceed as given here

Fig.17 Distance wire feed nozzle/ outlet nozzle

Tools required:

- 1 engineer's wrench, spanner width 10
- 2 engineer's wrench, spanner width 13

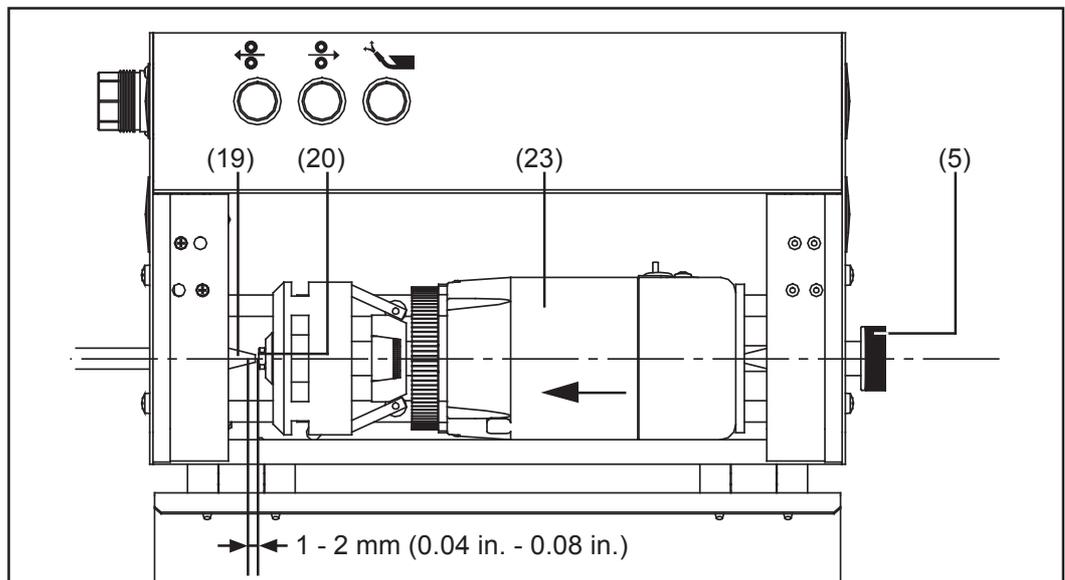


Fig.18 Set a distance of approx. 1 - 2 mm

- Turn the positioning screw (5) so far until there is a distance of 1 - 2 mm (0.04 - 0.08 in) - between the outlet nozzle (20) and the nozzle (19) on the wire feed hose
- If the distance of 1 - 2 mm is reached without a problem: Leave the following section out and continue as per the section „Setting the Distance“

Important! Should it not be possible to reduce the distance to 2 mm (0.08 in.) in spite of turning the positioning screw, then please proceed as per the following section:

- „Distance of 2 mm (0.08 in.) is not achieved“

Distance of 2 mm (0.08 in.) is not achieved

Important! This section applies should it not be possible to reduce the distance to 1 - 2 mm (0.04 - 0.08 in.) by turning the positioning screw (5) -Fig. 19 - between the outlet nozzle and nozzle on the wire feed hose - in spite of turning the positioning screw.

Tools required:

- 1 engineer's wrench, spanner width 10
- 2 engineer's wrench, spanner width 13

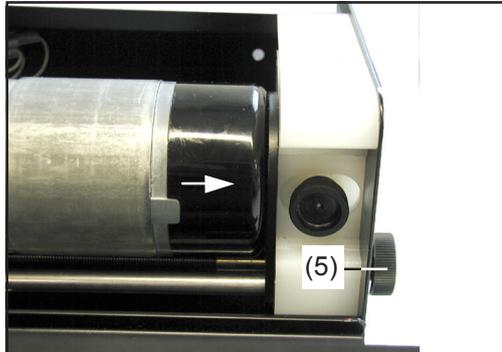


Fig.19 Push the drive unit to the right completely

- Push the drive unit to the right as far as the stop - by turning the positioning screw (5).
- Remove wire feed hose
- Remove planetary head (see chapter „Replacing the Inlet Nozzle“)

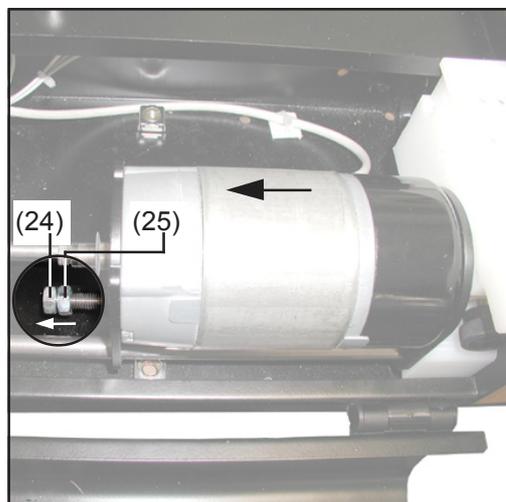


Fig.20 Screw the hexagon nuts on to the end of the threaded rod

- Turn the hexagon nuts (24) and (25) using two engineer's wrenches (spanner width 13) and turn as far as the end of the threaded rod
- Fit planetary head
- Fit wire feed hose
- Push the drive unit to the left as far as the stop - by turning the positioning screw (5) - Fig. 19.
- Then proceed as per the section „Setting the Distance“

Set distance

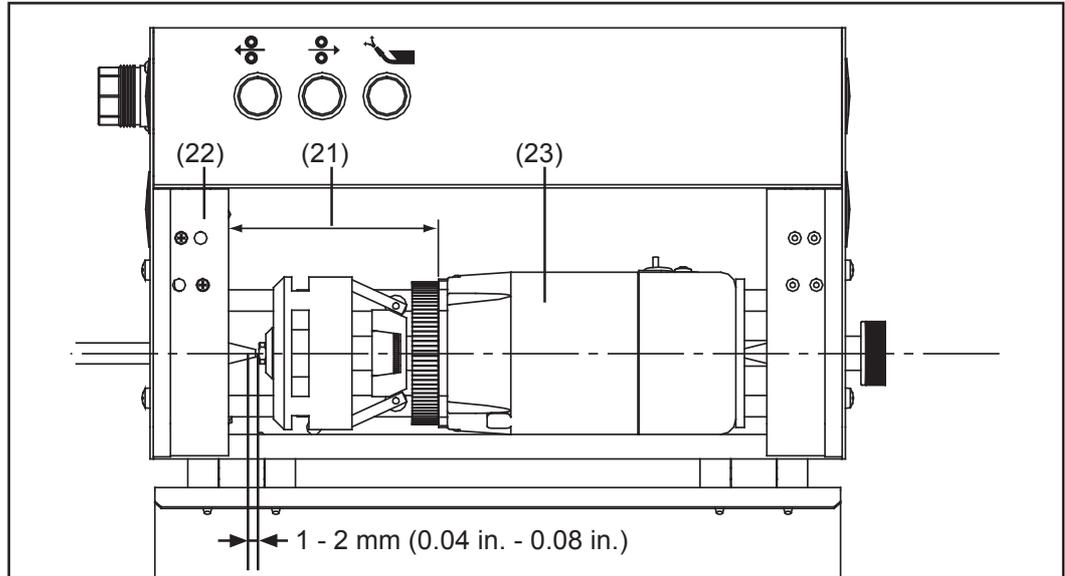


Fig.21 Measure the distance tensioning block / motor

- Measure the distance (21) from the tensioning block (22) to the motor (23) and make a note of it
- Remove wire feed hose

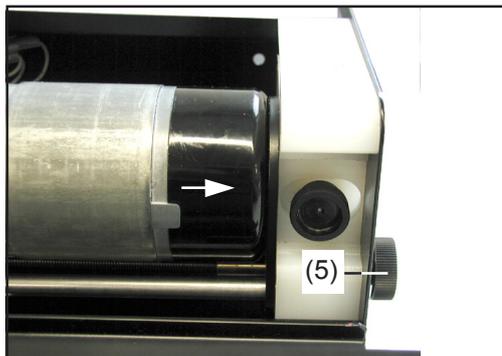


Fig.22 Push the drive unit to the right completely

- Push the drive unit to the right as far as the stop - by turning the positioning screw (5).
- Unscrew planetary head (see chapter „Replacing the Inlet Nozzle“)

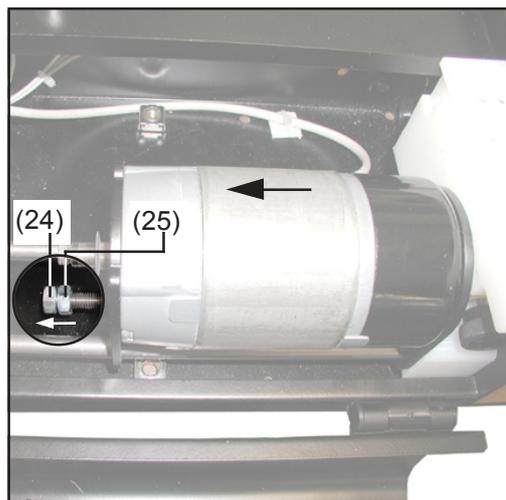


Fig.23 Slacken hexagon nuts

- Slacken the hexagon nuts (24) and (25) using two engineer's wrenches (spanner width 13)
- Reset the previously noted distance (21) - Fig. 21 - by turning the positioning screw (5) - Fig. 22

Set distance
(continued)

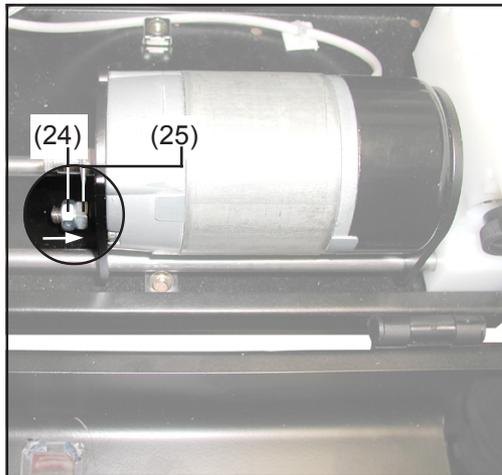


Fig.24 Position the drive unit and fix the hexagon bolts

- Turn the hexagon nuts (24) and (25) by hand as far as the motor mount
- Hold the hexagon nuts (25) using an engineer's wrench (spanner width 13)
- Tighten the hexagon nuts (24) using a second engineer's wrench (spanner width 13)

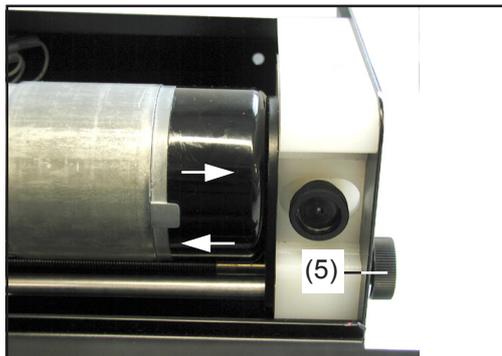


Fig.25 Push the drive unit to the right completely

- Push the drive unit to the right as far as the stop - by turning the positioning screw (5).
- Tighten planetary head (see chapter „Replacing the Inlet Nozzle“)
- Fit wire feed hose
- Push the drive unit to the left as far as the stop - by turning the positioning screw (5).
- Close the wire feed lid



Fitting wire feed hose from the welding wire drum or from the large spool

Safety

WARNING! Work that is carried out incorrectly can cause serious personal injury and damage to property.
 - Before starting read the „Safety Regulations“ chapter

CAUTION! Risk of injury from rotating parts. Only thread the wire in or rewind it using the button(s) when the lid is closed.

CAUTION! Risk of injury when the lid is open for maintenance or setting up. Ensure that the rotating drive parts of the VR 1530 PD can not be started by pushing the feeder inching button(s) on the operating panel, on the VR 1530 PD itself or on other system extensions.

Fastening wire feed hose

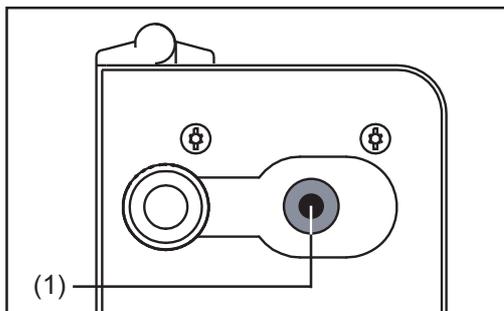


Fig.26 Push the wire feed hose in

Wire feed hose from the welding wire drum or from the large spool:

- Open wire feed lid
- Push wire feed hose (15) - Fig. 27 - with the wire feed nozzle into the mount (1) - Fig. 26.

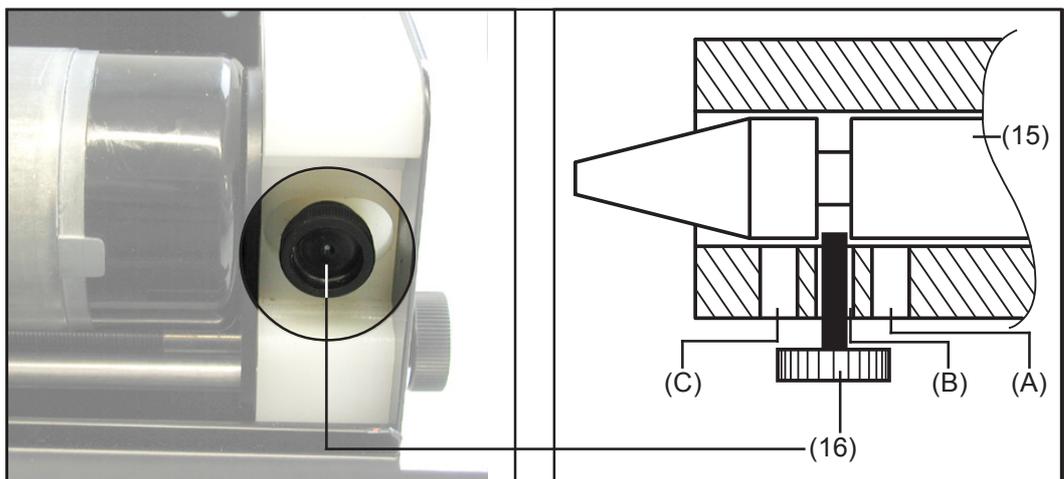


Fig.27 Fix the wire feed hose in place

- Slacken knurled screw (16)
- Insert knurled screw (16) in one of the positions (A), (B) or (C) dependent on the wire feed hose used
- Screw knurled screw (16) in slightly
- Position wire feed hose (15), so that the knurled screw (16) can be felt clicking into place in the notch on the brass piece on the wire feed hose
- Fasten the wire feed hose using the knurled screw (16)
- Close the wire feed lid

Replacing wire guide nozzles

Safety

WARNING! Work that is carried out incorrectly can cause serious personal injury and damage to property.
- Before starting read the „Safety Regulations“ chapter

CAUTION! Risk of injury when the lid is open for maintenance or setting up. Ensure that the rotating drive parts of the VR 1530 PD can not be started by pushing the feeder inching button(s) on the operating panel, on the VR 1530 PD itself or on other system extensions.

Tools required

- Engineer's wrench, spanner width 10

Accessories

The VR 1530 PD is fitted for a wire diameter of 1.2 mm (0.045 in.). The inlet nozzles for the remaining wire diameters are offered within the framework of the equipment sets listed in the following. Please take the order numbers from the spare parts list in the appendix to the operating instructions.

- Inlet/Outlet parts for wire diameter 1.0 mm (0.039 in.)
- Inlet/Outlet parts for wire diameter 1.6 mm (1/16 in.)

Preparation

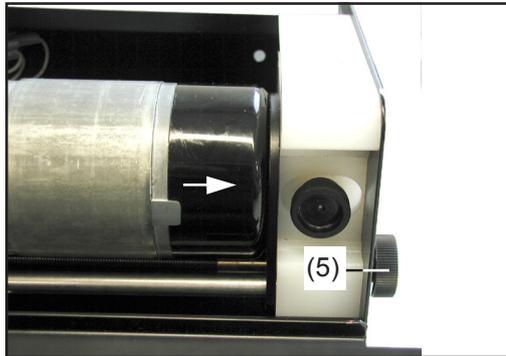


Fig.28 Push the drive unit to the right completely

- Unthreading welding wire (for more details on unthreading welding wire see chapter „Threading Welding Wire In“)
- Remove wire feed hoses (for more details on removing the wire feed hoses see the following chapter:
 - „Removing the wire feed hose to the VR 1500“
 - „Remove wire feed hose from the welding wire drum or from the large spool“)
- Push the drive unit to the right as far as the stop - by turning the positioning screw (5).

Unscrewing the planetary head

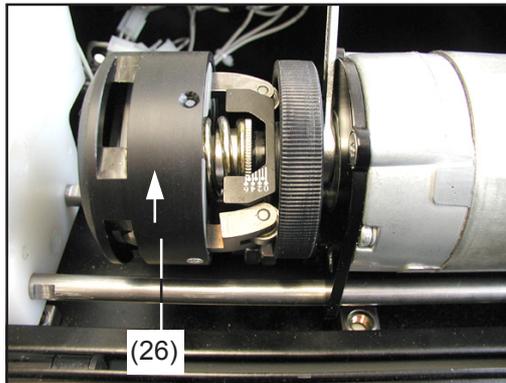


Fig.29 Unscrewing the planetary head

Important! Before removing the planetary head pay attention to the following block „O-ring seal and cup spring“

- Stop the motor shaft using an engineer's wrench (spanner width 10)
- Unscrew the planetary head (26) carefully by hand in the direction of the arrow

O-ring seal and cup spring

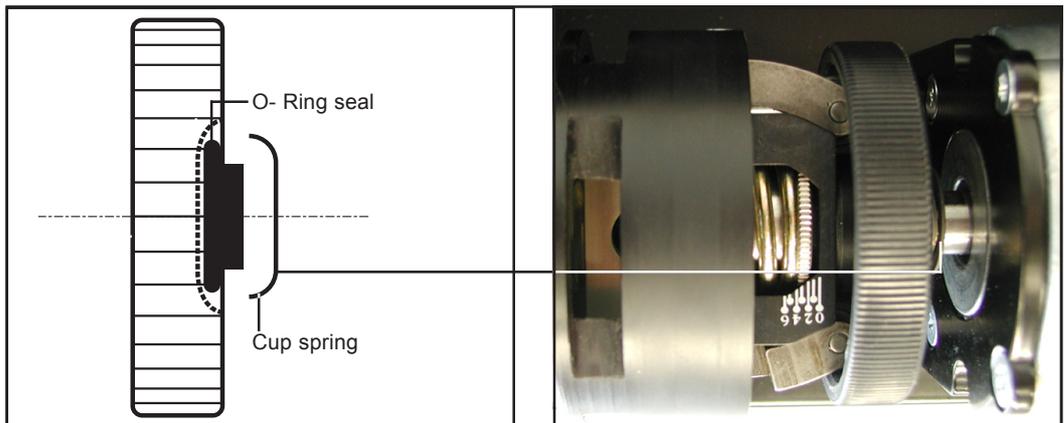


Fig.30 O-ring seal and cup spring



NOTE! When the planetary head is removed the O-ring seal and cup spring fall out. Please ensure that these parts are not lost.

Removing the wire guide nozzles

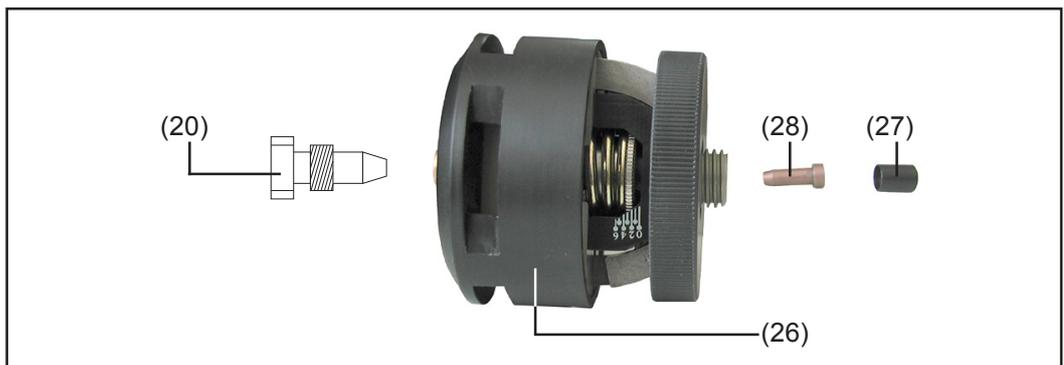


Fig.31 Removing the wire guide nozzles

- Shake the spacer (27) and the inlet nozzle (28) carefully out of the planetary head (26)
- Hold the planetary head (26) tight
- Slacken the outlet nozzle (20) on the planetary head (26) using an engineer's wrench (spanner width 8)

Fitting the wire guide nozzles

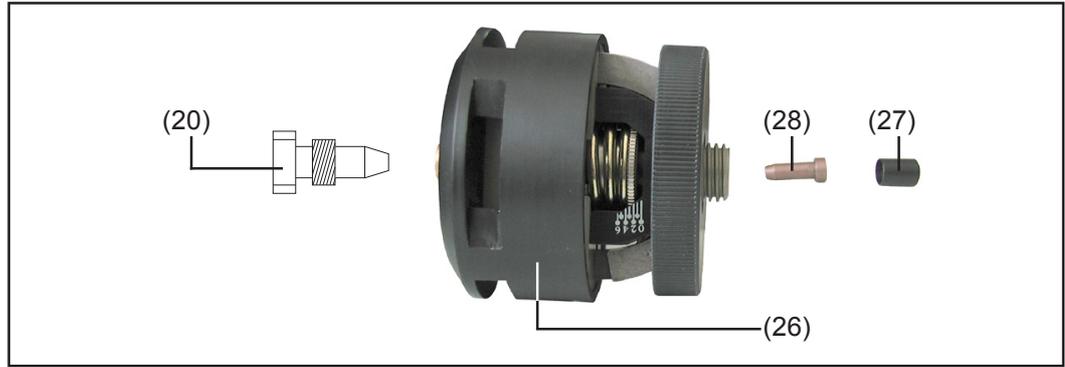


Fig.32 Fitting the wire guide nozzles

- Align the inlet nozzle (28) and spacer (27) as per the illustration.
- Insert the inlet nozzle (28) and the spacer (27) in the planetary head (26)

NOTE! Shake carefully to ensure that the inlet nozzle and spacer have been inserted in the planetary head completely.

- Hold the planetary head (26) tight
- Tighten the outlet nozzle (20) on the planetary head (26) using an engineer's wrench (spanner width 8)

Positioning the O-ring seal and cup spring

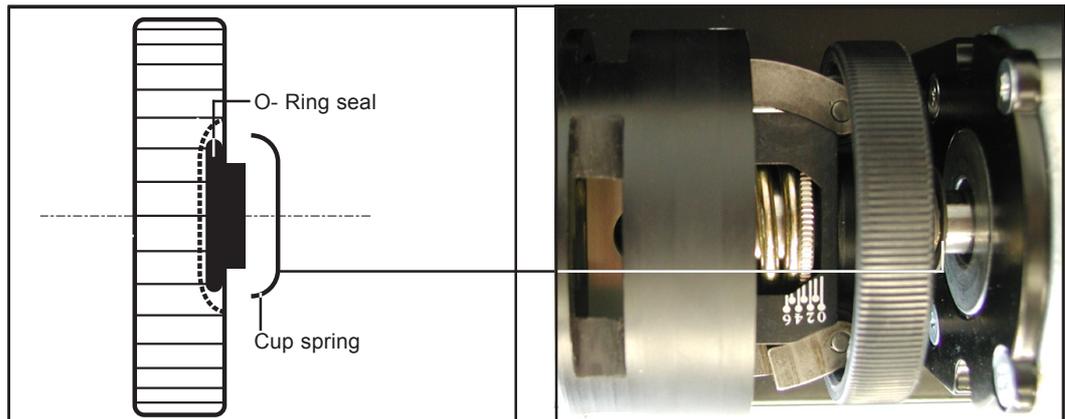


Fig.33 Positioning the O-ring seal and cup spring

NOTE! Before setting the planetary head in place, position the O-ring seal and cup spring as per Fig. 32. Care must be taken that the cup spring is aligned as per the illustration.

Tightening the planetary head

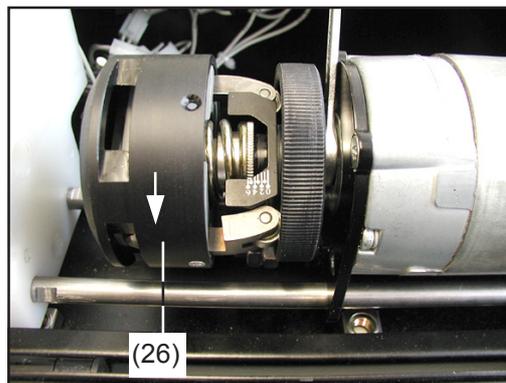


Fig.34 Tightening the planetary head

- Place the planetary head (26) against the motor shaft
- Stop the motor shaft using an engineer's wrench (spanner width 10)
- Tighten the planetary head (26) by hand in the direction of the arrow

NOTE! Replace the outlet nozzle as well before refitting the planetary drive:

- in accordance with the wire diameter, which corresponds to the new inlet nozzle
- in accordance with the following chapter „Replacing the Outlet Nozzle“

- Follow up work**
- Push the drive unit to the left as far as the stop - by turning the positioning screw (5)
- Fig. 27.
 - Fitting the wire feed hoses (see following chapter:
 - „Fitting the wire feed hose to the VR 1500“
 - „Fit wire feed hose from the welding wire drum or from the large spool“)
 - Thread the welding wire in (see chapter „Threading in the Welding Wire“)

Setting contact pressure

Safety

WARNING! Work that is carried out incorrectly can cause serious personal injury and damage to property.
- Before starting read the „Safety Regulations“ chapter

CAUTION! Risk of injury when the lid is open for maintenance or setting up. Ensure that the rotating drive parts of the VR 1530 PD can not be started by pushing the feeder inching button(s) on the operating panel, on the VR 1530 PD itself or on other system extensions.

Disengaging the planetary head

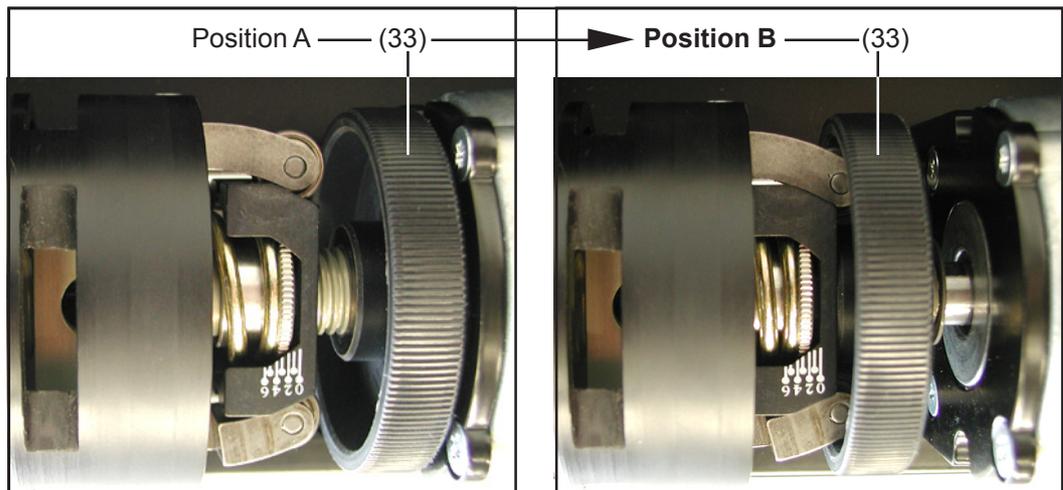


Fig.35 Disengaging the planetary head

- Open the lid
- Screw the knurled nut (33) in Position B (disengage VR 1530 PD)

NOTE! The contact pressure is set without the welding wire. If the welding wire is threaded in, unthread it

- Unthreading welding wire (for more details on unthreading welding wire see chapter „Threading Welding Wire In“)

Setting pressure spring to correct contact pressure

The VR 1530 PD planetary drive is fitted with a pressure spring (28) as standard. Applications in conjunction with the VR 1530 PD, require a certain setting range for the contact pressure. This setting range enables the pressure spring (28) together with the adjusting screw (29) to

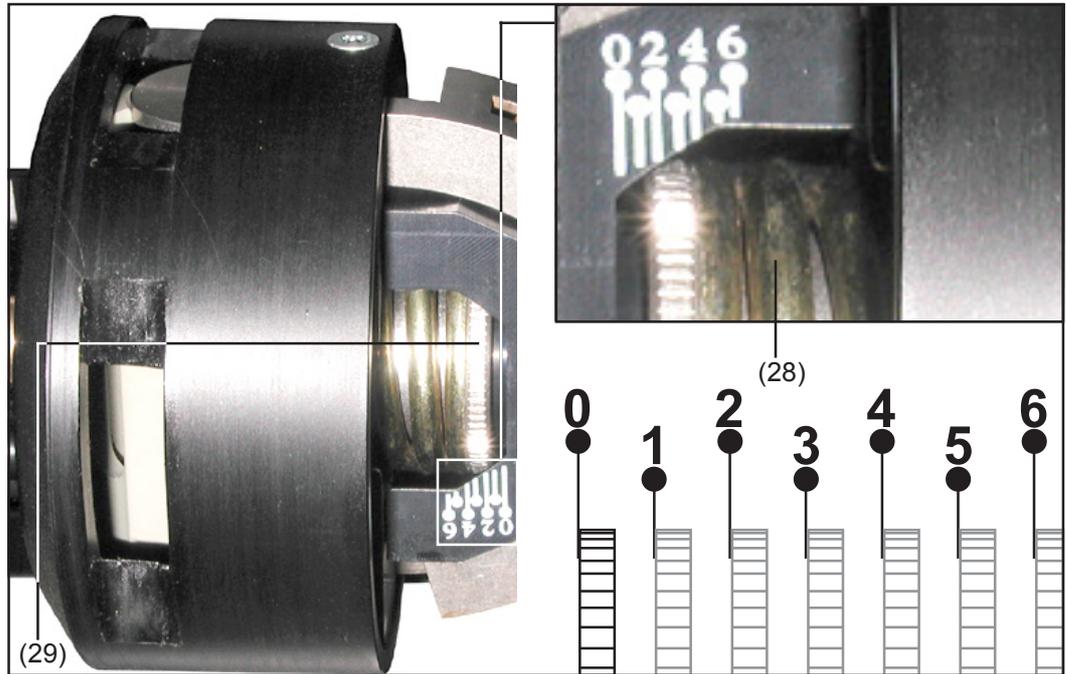


Fig.36 Knurled screw for setting the contact pressure

- Set the contact pressure using the adjusting screw (29) in accordance with the following table, according to
 - Material
 - Wire diameter
 - Wire speed

Important! A higher setting value for the adjusting screw has the following effects:

- Increased directive efficiency
- Greater danger of welding and air deformation

Weld metal	Wire diameter	Setting Adjusting screw (29)	Maximum Wire speed	PPU-Variant VR 1530 PD
Steel	1.0 mm	0 - 3	20 m/min (788 ipm)	55
Steel	1.2 mm	0 - 2	22 m/min (867 ipm)	56
Stahl	1,6 mm	0 - 2	22 m/min (867 ipm)	57
CrNi	1.0 mm			In preparation
CrNi	1.2 mm			In preparation
CrNi	1.6 mm			In preparation
CuSi	1.0 mm			In preparation
CuSi	1.2 mm			In preparation
CuSi	1.6 mm			In preparation

Engaging the planetary drive

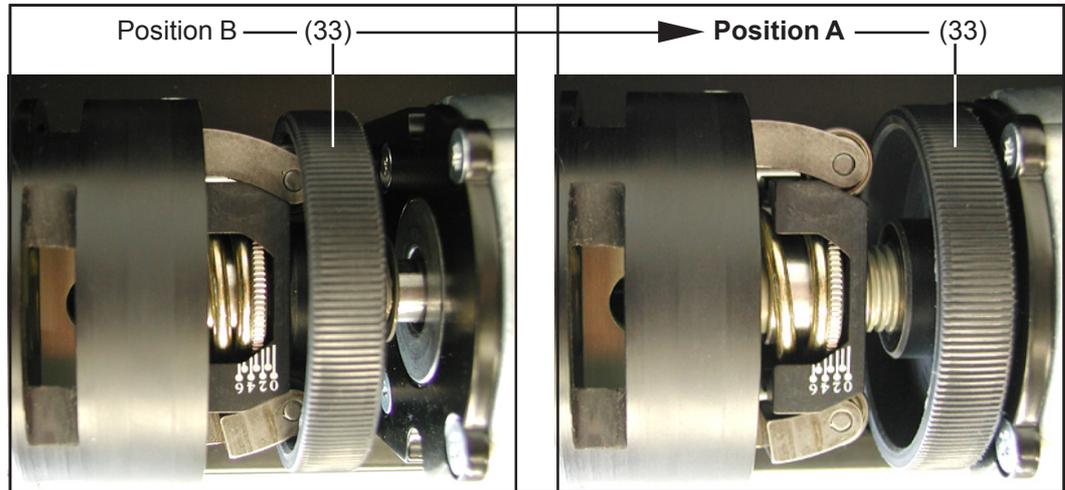


Fig.37 Engaging the planetary drive

- Thread the welding wire in, as per chapter „Threading in the Welding Wire“
- Screw the knurled nut (33) in Position A (engage VR 1530 PD)



NOTE! For faultfree operation, fix the knurled nut (33) by tightening hand tight in position (A).

Important! The drive unit of the VR 1530 PD is only engaged when the wire is transported further when the planetary head is turned.

- Close the lid

Threading welding wire in

Insulated routing of welding wire to wirefeeder



WARNING! Risk of serious injury and material damage or an inferior weld as the result of earth contact or short-circuit of an uninsulated welding wire. In the case of automated applications, ensure that only insulated welding wire is routed from the welding wire drum, large wirefeeder spool or wirespool to the wirefeeder (e.g. by using a wirefeeding hose).

An earth contact or short circuit can be caused by:

- an uninsulated, exposed length of welding wire coming into contact with an electrically conductive object during welding
- missing insulation between the welding wire and the earthed enclosure of a robot cell
- chafed wirefeeding hoses, exposing the welding wire

Using wirefeeding hoses ensures that the welding wire remains insulated as it is transported towards the wirefeeder. To prevent chafing, do not route the wirefeeding hose over sharp edges. Use hose holders or hose protectors as necessary.

Coupling pieces and hoods for welding wire drums also ensure safe transport of the welding wire.

Safety

WARNING! Work that is carried out incorrectly can cause serious personal injury and damage to property.
- Before starting read the „Safety Regulations“ chapter

CAUTION! Risk of injury when the lid is open for maintenance or setting up. Ensure that the rotating drive parts of the VR 1530 PD can not be started by pushing the feeder inching button(s) on the operating panel, on the VR 1530 PD itself or on other system extensions.

GB

Preparation

- Fit wire feed hoses (chapter „Fitting the wire feed hose to the VR 1500“ and „Fitting the wire feed hose from the welding wire drum or the large spool“)

NOTE! Before threading the welding wire in, the correct contact pressure must be set on the VR 1530 PD.

- According to the wire speed and the wire diameter
- As per chapter „Setting the Contact Pressure“

Disengaging the planetary head

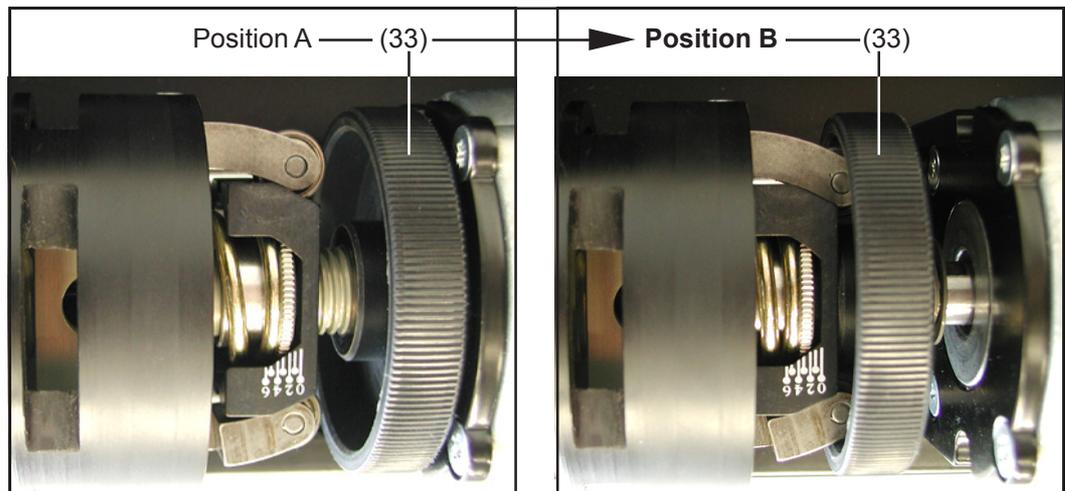


Fig.38 Disengaging the planetary head

- Open the lid
- Screw the knurled nut (33) in Position B (disengage VR 1530 PD)

Threading welding wire in

CAUTION! Risk of injury due to the spring effect of the coiled welding wire. When threading in the welding wire, hold the end of the wire firmly, to prevent any injuries that might be caused by the wire flicking back.

- Align approx. 15 cm (6 in.) of the first piece of wire
- Deburr and chamfer the edges of the cut end

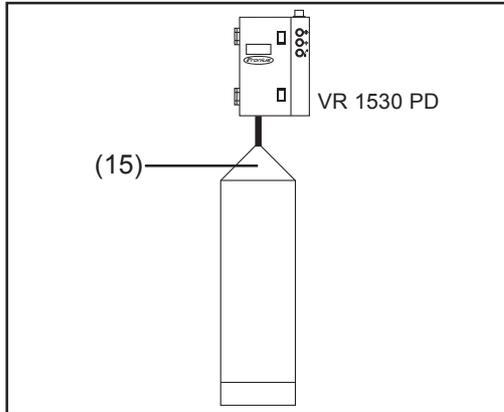


Fig.39 Thread the welding wire into the wire feed hose

- Thread the welding wire in the wire feed hose (15) from the welding wire drum or from the large spool.

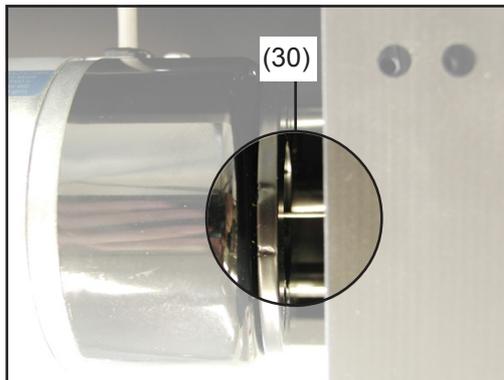


Fig.40 Thread the welding wire into the planetary drive

- Thread the welding wire in on the planetary drive at position (30)
- NOTE!** If the wire comes to a point when threading it through the planetary drive, turn the planetary head during pushing.

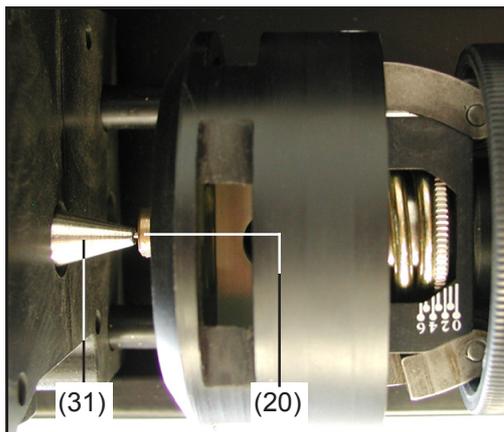
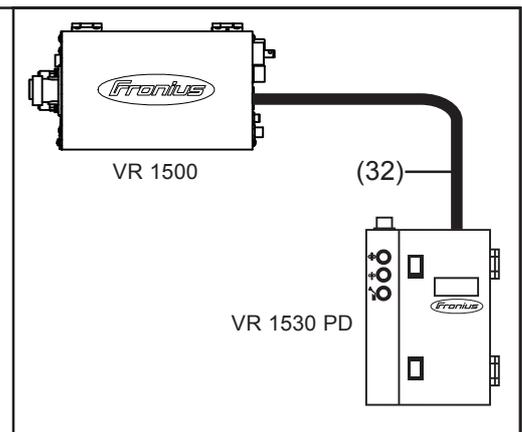


Fig.41 Thread the welding wire through the outlet nozzle and into the wire feed hose for the VR 1500



- Thread the welding wire through the outlet nozzle (20) and the nozzle (31) into the wire feed hose (32) to the VR 1500.

NOTE! If the wire comes to a point when threading it through the planetary drive, turn the planetary head during pushing.

Engaging the planetary drive

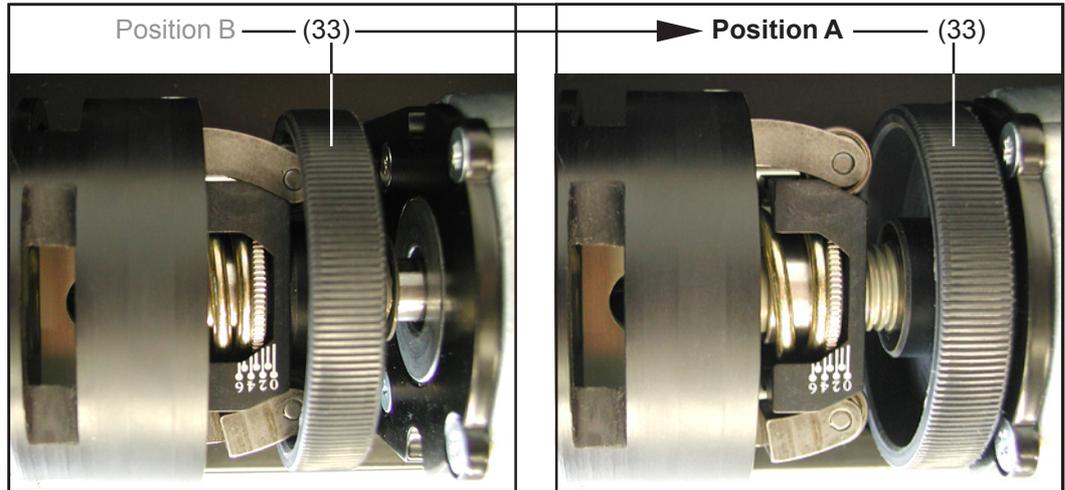


Fig.42 Engaging the planetary drive

- Screw the knurled nut (33) in Position A (engage VR 1530 PD)

 **NOTE!** For faultfree operation, fix the knurled nut (33) by tightening hand tight in position (A) (see chapter „Threading in the Welding Wire“).

Important! The drive unit of the VR 1530 PD is only engaged when the wire is transported further when the planetary head is turned.

- Close the lid



CAUTION! Risk of injury from rotating parts of the planetary drive. Let the welding wire run in only when the lid of the VR 1530 PD is closed. If it is not possible to let the wire run in for technical reasons, take care that no body parts, hair or clothing can be caught by the rotating parts.

- Thread the welding wire in the remaining components of the wire feed system and let it run in

Replacing feed rollers

Safety



WARNING! Work that is carried out incorrectly can cause serious personal injury and damage to property.

- Before starting read the „Safety Regulations“ chapter



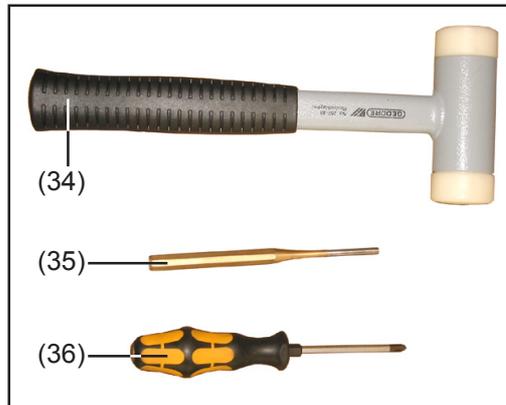
CAUTION! Risk of injury when the lid is open for maintenance or setting up.

Ensure that the rotating drive parts of the VR 1530 PD can not be started by pushing the feeder inching button(s) on the operating panel, on the VR 1530 PD itself or on other system extensions.

General

After approx. 1200 operating hours and/or when the wire feeding properties are getting worse we recommend a replacement of the wire feed rollers.

Tools required



- (34) wooden or plastic mallet
- (35) drift punch
- (36) crosstip screwdriver

Fig.43 Tools required

Preparation

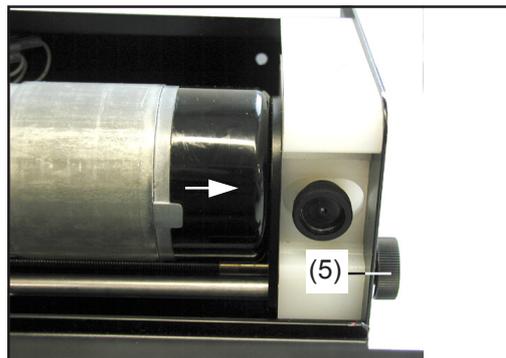


Fig.44 Push the drive unit to the right completely

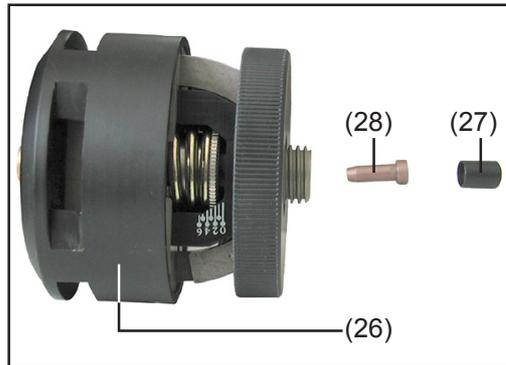
- Unthreading welding wire (for more details on unthreading welding wire see chapter „Threading Welding Wire In“)
- Remove wire feed hoses (for more details on removing the wire feed hoses see the following chapter:
 - „Removing the wire feed hose to the VR 1500“
 - „Remove wire feed hose from the welding wire drum or from the large spool“)

- Push the drive unit to the right as far as the stop - by turning the positioning screw (5).

Detaching the planetary head

- Detach the planetary head (see chapter „Replacing wire guide nozzles“)

Removing the spacer and the inlet nozzle



- Shake the spacer (27) and the inlet nozzle (28) carefully out of the planetary head (26)

Fig.45 Removing the spacer and the inlet nozzle

Disassembling the planetary head

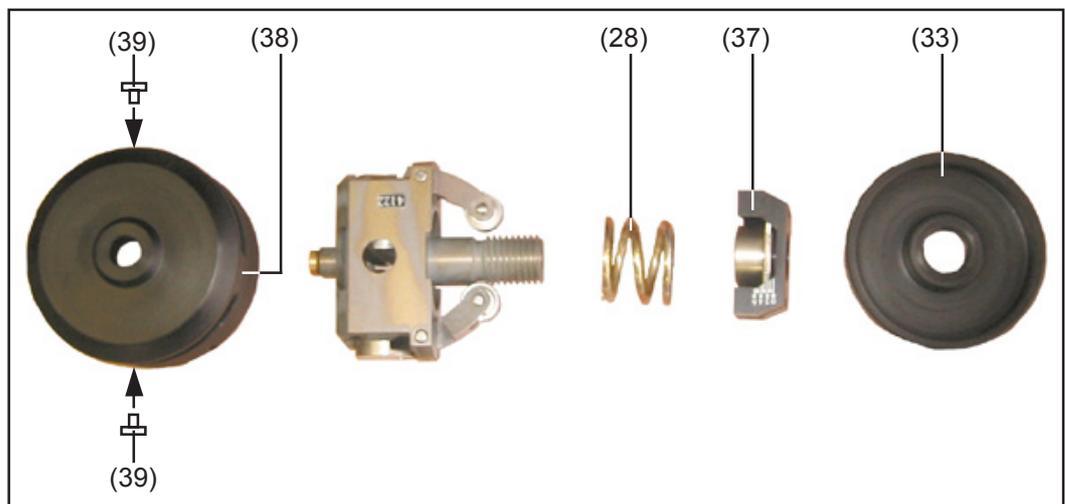
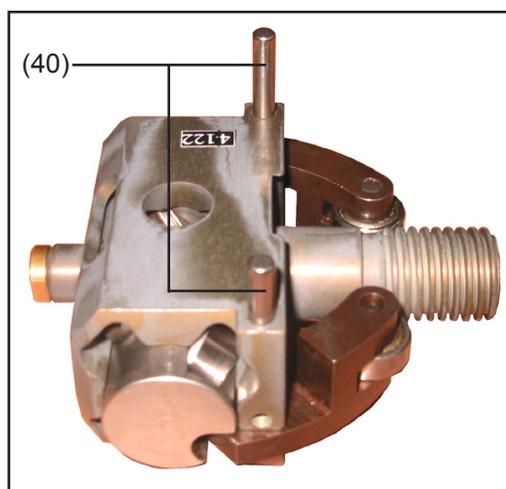


Fig.46 Disassembling the planetary head

- Screw off the knurled nut (33)
- Take off the adjusting unit (37)
- Take off the pressure spring (28)
- Dismantle the cover (38) by loosening the two recessed head screws (39)

Taking off the rocking lever arbors



- Press out the rocking lever arbors (40) by means of a drift punch

Fig.47 Taking out the rocking lever arbors

Removing the mounts for wire feed rollers

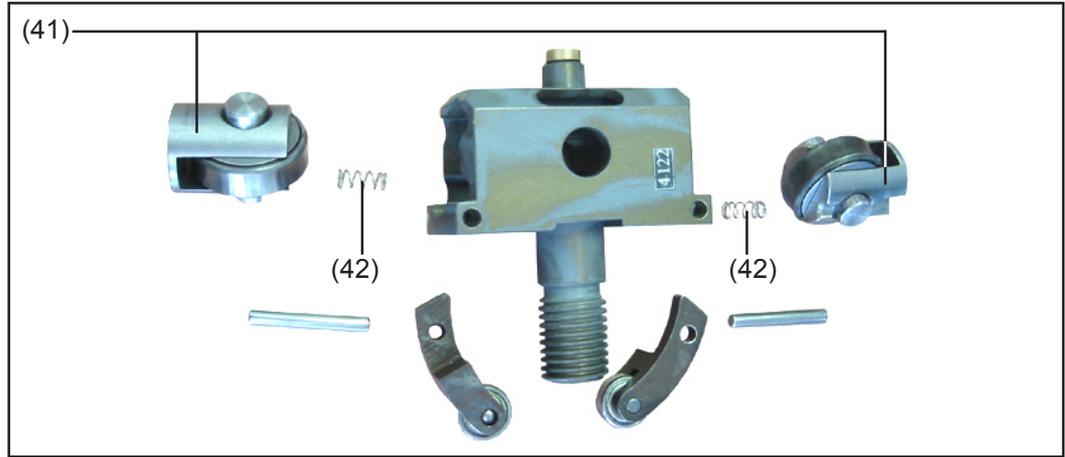


Fig.48 Removing the wire feed rollers with mounts

NOTE! When taking out the mounts (41) make sure that the springs (42) don't get lost. You will need them again for reassembling the unit.

- Take out the mounts (41) with the wire feed rollers.

Dismantling the wire feed rollers

NOTE! Danger of damage to arbors. When taking the arbors (43) out of the mounts (41) use a wooden or plastic mallet only. Never use a metal hammer.

- Remove the arbors (43) for the wire feed rollers (44) by means of a drift punch and a wooden or plastic mallet .

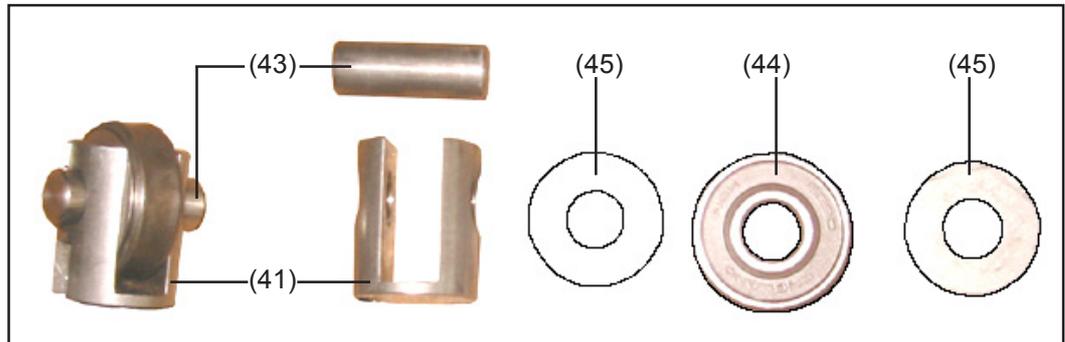


Fig.49 Removing the knock-out arbors

Important! The following components will be required for reassembling the unit:

- mounts (41)
- arbors (43)
- spacer disks (45)

Installing the wire feed rollers

NOTE! Danger of damage to arbors. When inserting the arbors (43) into the mounts (41) - Fig. 49 - use a wooden or plastic mallet only. Never use a metal hammer.

- Install the spacer disks (45) - Fig. 51 - and the new wire feed rollers (44) via the arbors (43).

Installing the mounts for wire feed rollers

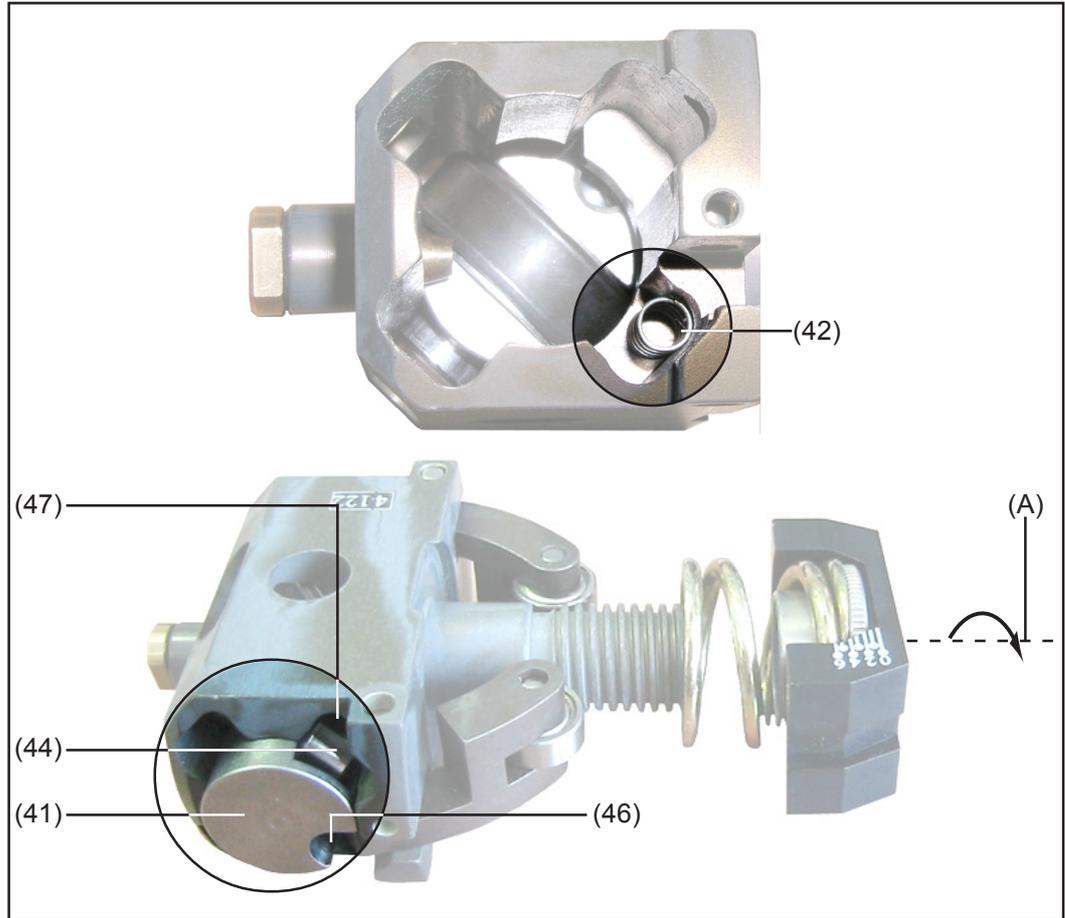
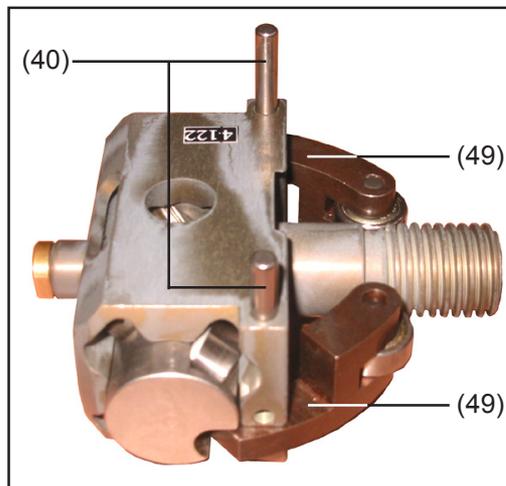


Fig.50 Installing the wire feed rollers with mounts

- Insert the first spring (42)
- Insert the first completely equipped mount (41) in such a way that the wire feed roller (44) is engaged with the track (47)
- Subsequently turn the unit round the axis (A) and insert the following elements as depicted in Fig. 50:
 - the second spring (42)
 - the second complete mount (41)

Important! The installation of the elements additionally depicted above is described in detail below.

Installing the rocking lever arbors



- Install the rocking levers (49) via the rocking lever arbors (40)

Fig.51 Installing the rocking levers



Assembling the planetary head

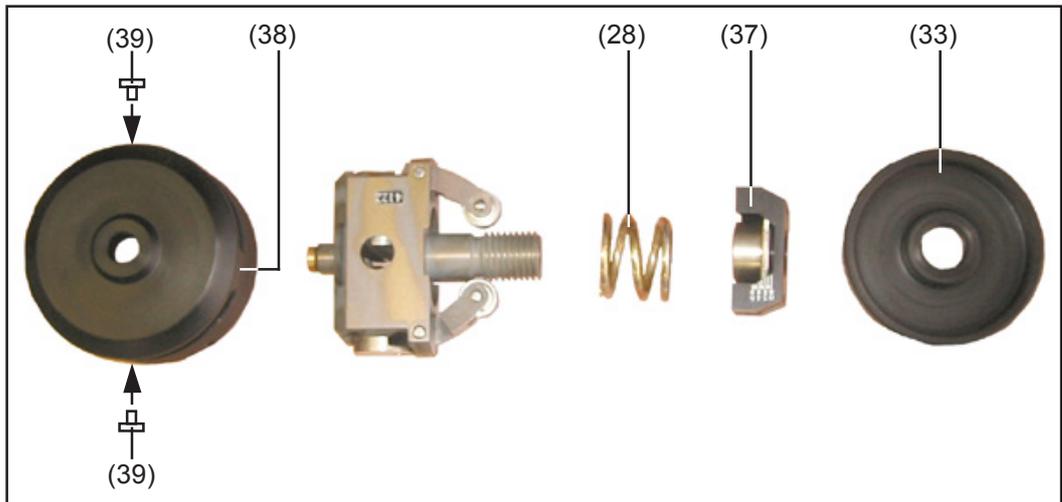
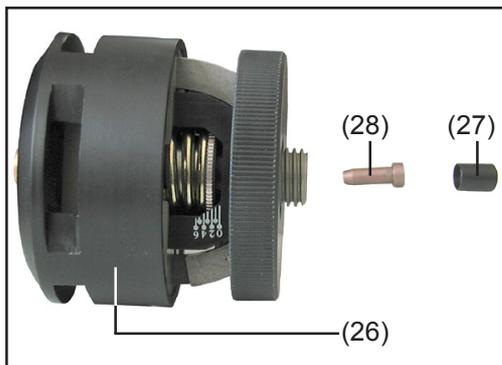


Fig.52 Assembling the planetary head

- Put on the pressure spring (28)
- Put on the adjusting unit (37)
- Mount the cover (38) by means of two recessed head screws (39)
- Tighten the knurled nut (33)

Inserting the spacer and the inlet nozzle



- Align the inlet nozzle (28) and spacer (27) as per the illustration.
- Insert the inlet nozzle (28) and the spacer (27) in the planetary head (26)

NOTE! Shake carefully to ensure that the inlet nozzle and spacer have been inserted in the planetary head completely.

Fig.53 Inserting the spacer and the inlet nozzle

Mounting the planetary head

- Mount the planetary head (see chapter „Replacing wire guide nozzles“)

Follow up work

- Push the drive unit to the left as far as the stop - by turning the positioning screw (5) - Fig. 27.
- Fitting the wire feed hoses (see following chapter:
 - „Fitting the wire feed hose to the VR 1500“
 - „Fit wire feed hose from the welding wire drum or from the large spool“)
- Thread the welding wire in (see chapter „Threading in the Welding Wire“)

Push-pull unit

General remarks

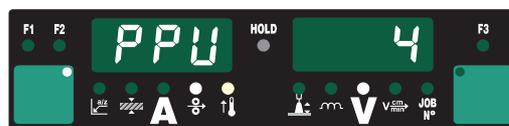
The VR 1530 PD must be calibrated:

- Before each first time use
- After the selection of another Push-pull unit
- Every time the wire feed software is updated

If the VR 1530 PD is not calibrated, standard parameters are used - in certain circumstances the welding result can be unsatisfactory.

- Select the "PPU" function in the second menu level (2nd).
(see the Operating instructions of the power source)

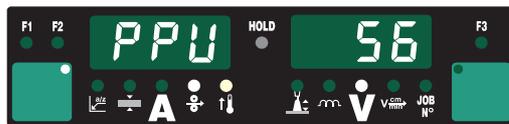
Push-pull unit selection



1. Select the "PPU" function in the second menu level (2nd).

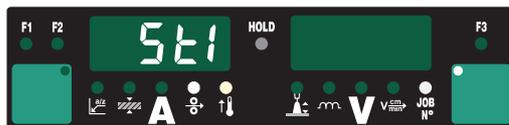
For an overview of the error messages which may occur during push-pull alignment, please refer to the following section headed "Service codes for push-pull alignment".

Push-pull alignment



2. Use the adjusting dial (or "Mode" button on the "Standard" control panel) to select the relevant variant of the VR 1530 PD:

- Select the appropriate variant of the VR 1530 PD from the table in the section headed ("Defining the contact pressure on the VR 1530 PD")



3. Press the torch trigger or „Feeder inching“ button once

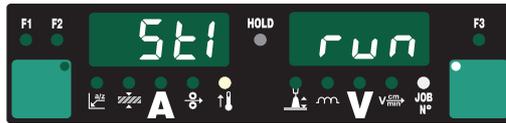
4. Disengage the drive units of all wirefeeder motors (VR 1530 PD, VR 1500 and Robacta Drive, ...) - the wirefeeder motors must not be under load (push-pull alignment - open circuit)

Important! The drive unit of the VR 1530 PD is not properly disengaged until it is possible to turn the drive-head with ease.

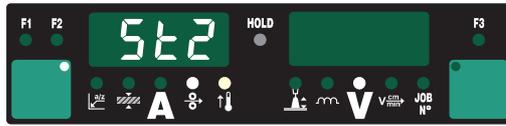


CAUTION! Danger of injury from rotating components. During the push-pull alignment, do NOT touch the inside of the VR 1530 PD; also, make sure that no hair or clothing can be caught up and pulled into the machine. When you have finished the push-pull alignment, close the cover of the VR 1530 PD.

Push-pull alignment
(continued)



5. Press the torch trigger or the „Feeder inching“ button again. The wirefeeder motors are aligned while not under load. During the alignment operation, the right-hand display will read “run”.



6. As soon as the alignment operation - in the unloaded state - is complete, the display will read “St2”.

7. Engage the drive units of all wirefeeder motors (e.g. VR 1530 PD, VR 1500, Ro-bactaDrive, ...) once again - the wirefeeder motors must be under load (push-pull alignment - engaged)

Important! The drive unit of the VR 1530 PD is not properly engaged until the wire continues to be fed when you turn the drive-head by hand.



CAUTION! Danger from wire emerging at speed. Hold the welding torch so that it points away from your face and body.



CAUTION! Danger of injury from rotating components. During the push-pull alignment, do NOT touch the inside of the VR 1530 PD; also, make sure that no hair or clothing can be caught up and pulled into the machine. When you have finished the push-pull alignment, close the cover of the VR 1530 PD.



8. Press the torch trigger or the „Feeder inching“ button once again. The wirefeeder motors are aligned while under load. During the alignment operation, the right-hand display will read “run”.



9. The push-pull alignment is finished when the previously set values “PPU” and e.g. “56” reappear on the display.

10. Press the “Store” button twice to exit from the Set-up menu.

Important! In the following section, you will find a description of the service codes that can be displayed during the push-pull alignment.

Service codes for push-pull alignment

Safety



WARNING! An electric shock can be fatal. Before opening up the machine:

- shift the mains switch into the "O" position
- unplug the machine from the mains
- put up an easy-to-understand warning sign to stop anybody inadvertently switching it back on again
- using a suitable measuring instrument, check to make sure that electrically charged components (e.g. capacitors) have been discharged

Error codes shown when the drive units are disengaged ("open-circuit" alignment)

Err | Eto

Cause: Incorrect measurement during push-pull alignment.

Remedy: Repeat push-pull alignment

St1 | E 1

Cause: At minimum wirefeed speed, the wirefeeder motor does not deliver any actual rotational speed value.

Remedy: Repeat the push-pull alignment. If the error message re-appears: Contact After-Sales Service.

St1 | E 2

Cause: At maximum wirefeed speed, the wirefeeder motor does not deliver any actual rotational speed value.

Remedy: Repeat the push-pull alignment. If the error message re-appears: Contact After-Sales Service.

St1 | E 3

Cause: At minimum wirefeed speed, the wirefeeder motor does not deliver any actual rotational speed value.

Remedy: Repeat the push-pull alignment. If the error message re-appears: Contact After-Sales Service.

St1 | E 4

Cause: At minimum wirefeed speed, the motor of the push-pull unit does not deliver any actual rotational speed value.

Remedy: Repeat the push-pull alignment. If the error message re-appears: Contact After-Sales Service.

St1 | E 5

Cause: At maximum wirefeed speed, the wirefeeder motor does not deliver any actual rotational speed value.

Remedy: Repeat the push-pull alignment. If the error message re-appears: Contact After-Sales Service.

St1 | E 6

Cause: At maximum wirefeed speed, the motor of the push-pull unit does not deliver any actual rotational speed value.

Remedy: Repeat the push-pull alignment. If the error message re-appears: Contact After-Sales Service.

Error codes shown when the drive units are engaged (“engaged” alignment)

St1 | E 16

Cause: Push-pull alignment has been interrupted: Quick-stop was activated by pressing the torch trigger.
Remedy: Repeat push-pull alignment

St2 | E 7

Cause: "Push-pull alignment - open-circuit" has not been carried out
Remedy: Carry out "push-pull alignment - open-circuit"

St2 | E 8

Cause: At minimum wirefeed speed, the motor of the wirefeeder does not deliver any actual rotational speed value.
Remedy: Repeat the push-pull alignment. If the error message re-appears: Contact After-Sales Service.

St2 | E 9

Cause: At minimum wirefeed speed, the motor of the push-pull unit does not deliver any actual rotational speed value.
Remedy: Repeat the push-pull alignment. If the error message re-appears: Contact After-Sales Service.

St2 | E 10

Cause: At minimum wirefeed speed, the motor current of the wirefeeder motor is outside the permitted range. Possible causes of this include the wirefeeder motors not being engaged, and other wirefeed problems.
Remedy: Engage the drive units of both wirefeeder motors, arrange the hosepack in as straight a line as possible; check the inner liner for kinks or soiling; check the contact pressure on the 2-roller or 4-roller drive of the push-pull unit.
Repeat the push-pull alignment. If the error message re-appears: Contact After-Sales Service.

St2 | E 11

Cause: At minimum wirefeed speed, the motor current of the push-pull unit is outside the permitted range. Possible causes of this include the wirefeeder motors not being engaged, and other wirefeed problems.
Remedy: Engage the drive units of both wirefeeder motors, arrange the hosepack in as straight a line as possible; check the inner liner for kinks or soiling; check the contact pressure on the 2-roller or 4-roller drive of the push-pull unit.
Repeat the push-pull alignment. If the error message re-appears: Contact After-Sales Service.

St2 | E 12

Cause: At maximum wirefeed speed, the motor of the wirefeeder does not deliver any actual rotational speed value.
Remedy: Repeat the push-pull alignment. If the error message re-appears: Contact After-Sales Service.

St2 | E 13

Cause: At maximum wirefeed speed, the motor of the push-pull unit does not deliver any actual rotational speed value.
Remedy: Repeat the push-pull alignment. If the error message re-appears: Contact After-Sales Service (faulty actual-value pick-up)

**Error codes
shown when the
drive units are
engaged (“enga-
ged alignment”)**
(continued)

St2 | E 14

- Cause:** At maximum wirefeed speed, the motor current of the wirefeeder motor is outside the permitted range. Possible causes of this include the wirefeeder motors not being engaged, and other wirefeed problems.
- Remedy:** Engage the drive units of both wirefeeder motors, arrange the hosepack in as straight a line as possible; check the inner liner for kinks or soiling; check the contact pressure on the 2-roller or 4-roller drive of the push-pull unit.
Repeat the push-pull alignment. If the error message re-appears: Contact After-Sales Service.
-

St2 | E 15

- Cause:** At maximum wirefeed speed, the motor current of the push-pull unit is outside the permitted range. Possible causes of this include the wirefeeder motors not being engaged, and other wirefeed problems.
- Remedy:** Engage the drive units of both wirefeeder motors, arrange the hosepack in as straight a line as possible; check the inner liner for kinks or soiling; check the contact pressure on the 2-roller or 4-roller drive of the push-pull unit.
Repeat the push-pull alignment. If the error message re-appears: Contact After-Sales Service.
-

St2 | E 16

- Cause:** Push-pull alignment has been interrupted: Quick-stop was activated by pressing the torch trigger.
- Remedy:** Repeat push-pull alignment
-



Troubleshooting

General remarks The following section gives you an overview of the possible causes of errors in connection with the VR 1530 PD, and of steps you can take to remedy the problem. For detailed information on the causes of, and remedies for, errors in connection with wirefeeding in general, please refer to the operating instructions of your power source.

VR 1530 PD error diagnosis

No number (“PPU”) available for selecting the push-pull alignment

Cause: The “PMR4000 PullMig installation kit” has not been installed
Remedy: Install the installation kit

The number of the VR 1530 PD (e.g. “PPU | 56”) - for the push-pull alignment - cannot be selected

Cause: The “FS Drive” software has not been installed on the power source
Remedy: Equip the power source with the “FS Drive” software

The drive-head of the VR 1530 PD does not rotate

Cause: The control plug of the VR 1530 PD is not plugged in
Remedy: Connect up the control plug of the VR 1530 PD to the torch-control connection point on the wirefeeder or on the TPS 2700 power source

Cause: The connecting cable on the VR 1530 PD is defective
Remedy: Check the connecting cable and have it changed if necessary

Irregular wirefeed speed

Cause: The feed rollers of the VR 1530 PD are not applying sufficient pressure to the wire
Remedy: Turn the knurled nut completely into Position (B) (Fig.2), and tighten it by hand to fix it in place
Use a pressure spring that is suitable for the filler metal that is being used (see the section headed “Defining the contact pressure on the VR 1530 PD”)

Cause: The wrong contact pressure has been set on the 4-roller drive
Remedy: Set the correct contact pressure on the 4-roller drive (see the section headed “Configuration table”)

Cause: Wire feed rollers defective
Remedy: Replace wire feed rollers

Welding wire is deformed or snaps

Cause: The feed rollers of the VR 1530 PD are applying too much pressure to the wire
Remedy: Use a pressure spring that is suitable for the filler metal that is being used (see the section headed “Configuration table”)

Cause: The contact pressure on the 4-roller drive is set too high
Remedy: Set the correct contact pressure on the 4-roller drive (see the section headed “Configuration table”)

Cause: VR 1530 PD turns too fast or too slowly
Remedy: For push-pull alignment, select the right number (e.g. “PPU | 56”) for the VR 1530 PD (see the section headed “Configuration table”)

Cause: Wire feed rollers defective
Remedy: Replace wire feed rollers

VR 1530 PD error diagnosis
(continued)

VR 1530 PD overheats

Cause: Inadequate cooling; not enough coolant return-flow to the cooling unit, or none at all
Remedy: Check whether the VR 1530 PD is completely connected up; check the cooling unit and vent it if necessary; check the coolant through-flow in the VR 1530 PD

Err | 056

Cause: Wirefeeder lid not closed. Safety cutoff triggered.
Remedy: Close lid well and press Store button

EFd | xx.x, EFd | 8.1

Cause: Wirefeeder motor is stuck / defective
Remedy: Check the wirefeeder motor and replace it if necessary

EFd | 8.2

Cause: Error in the wirefeed system (overcurrent in the drive of the push-pull unit)
Remedy: Arrange the hosepack in as straight a line as possible; check the inner liner for kinks or soiling; check the contact pressure on the VR 1530 PD

EFd | 9.1

Cause: External supply voltage: The supply voltage has dropped below the tolerance range
Remedy: Check the external supply voltage

EFd | 9.2

Cause: External supply voltage: The supply voltage has risen above the tolerance range
Remedy: Check the external supply voltage

EFd | 12.1

Cause: No actual rotational speed value from the wirefeeder motor
Remedy: Check the actual-value pick-up and the cable connections to & from it, and replace if necessary

EFd | 12.2

Cause: No actual rotational speed value from the push-pull unit
Remedy: Check the actual-value pick-up and the cable connections to & from it, and replace if necessary



Care, maintenance and disposal

General remarks Under normal operating conditions, the VR 1530 PD needs only a minimum of care and maintenance. However, to ensure continued trouble-free operation of your welding torch for years to come, there are a few basic points that you should observe:

Every time before starting to use the VR 1530 PD - Inspect the VR 1530 PD, interconnecting cable and earth connection for any signs of damage

Disposal Dispose of used coolant, and of the VR 1530 PD itself at the end of its useful life, in accordance with all applicable national and local regulations.

Technical data

VR 1530 PD	VR 1530 PD
Supply voltage (supply via the power source)	42 V DC
Rated current	3.5 A
Wire speed	
at wire diameter 1.0 mm (0.035 in.)	20 m/min (788 ipm)
at wire diameter 1.2 mm (0.045 in.)	22 m/min (867 ipm)
at wire diameter 1.6 mm (1/16 in.)	22 m/min (867 ipm)
Protection system	IP 20
Dimensions (l x b x h)	360,5 x 215,5 x 124 mm (14.2 x 8.49 x 4.89 in.)
Weight	6,9 kg (15.2 lb.)
Wire diameter	1,0; 1,2; 1,6 mm (0.035; 0.045; 1/16 in.)
Drive	Planetary drive

(D) Ersatzteilliste
Schaltplan

(GB) Spare Parts List
Circuit Diagram

(F) Liste de pièces de rechange
Schéma de connexions

(I) Lista parti di ricambio
Schema

(E) Lista de repuestos
Esquema de cableado

(P) Lista de peças sobresselentes
Esquema de conexões

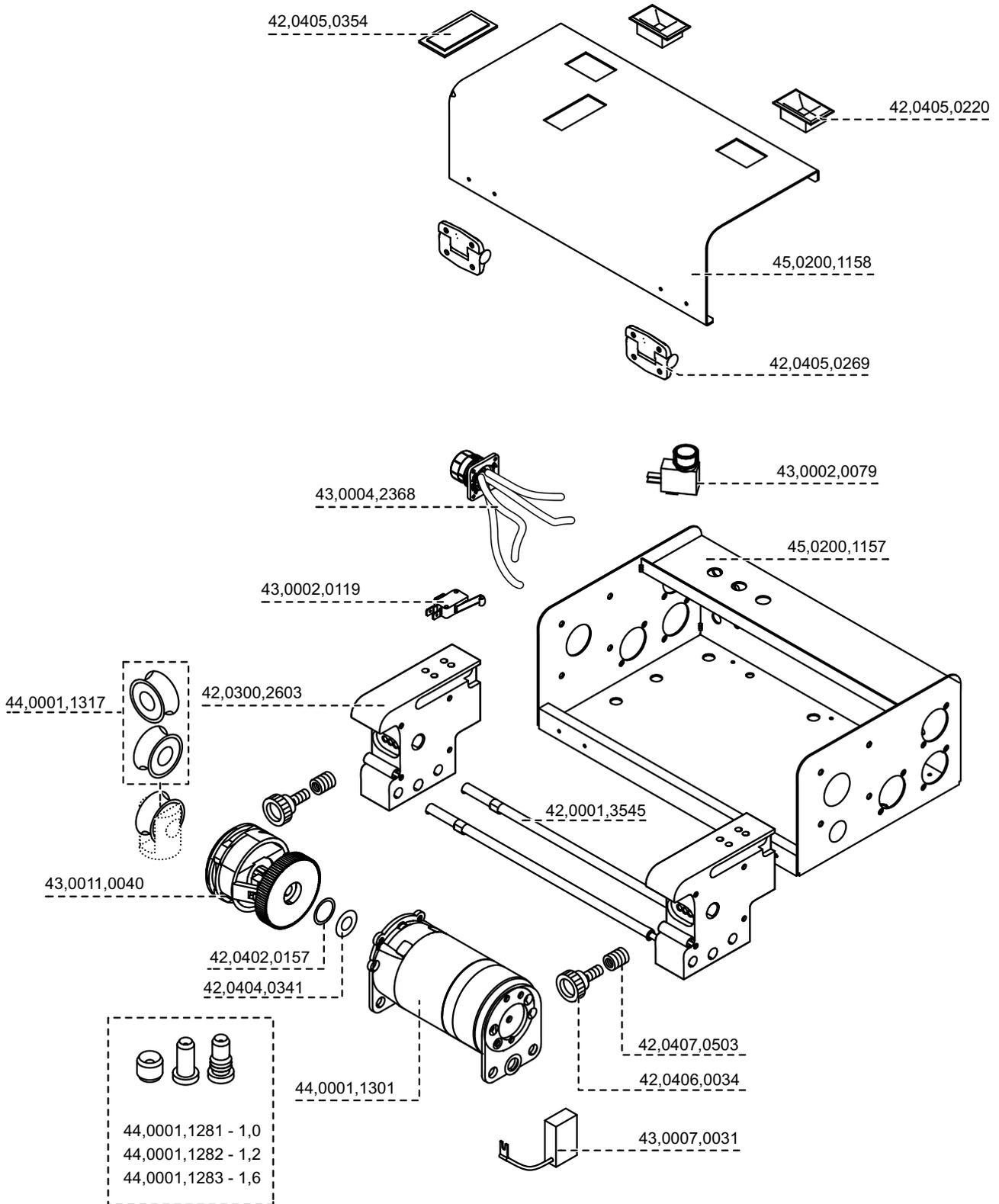
(NL) Onderdelenlijst
Bedradingsschema

(N) Reservdelsliste
Koblingsplan

(CZ) Seznam náhradních dílů
Schéma zapojení

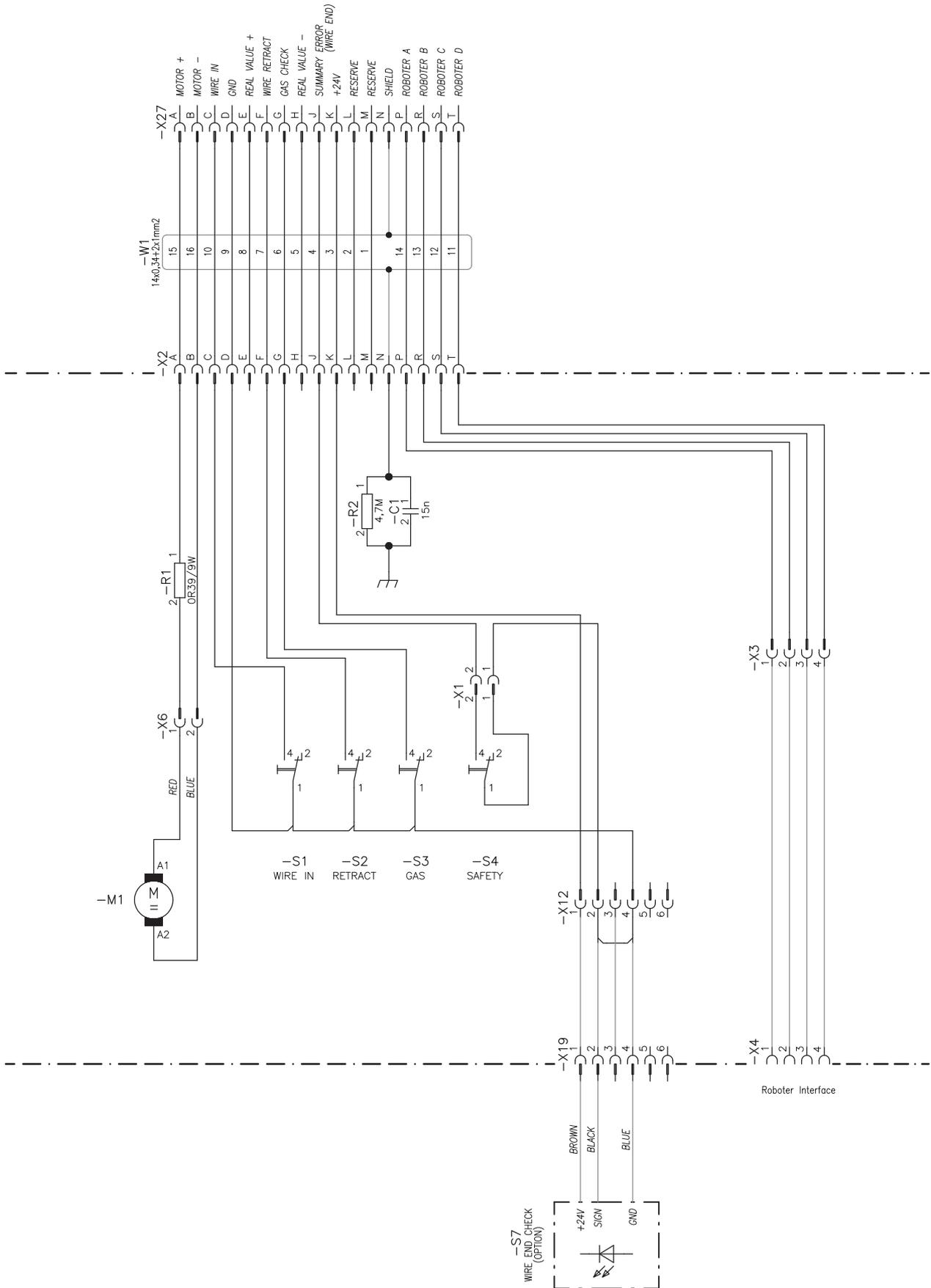
(RUS) Список запасных частей
Электрическая схема

(SK) Zoznam náhradných dielov
Schéma zapojenia



VR 1530 PD

CONTROL UNIT VR1500-xx





FRONIUS INTERNATIONAL GMBH

Buxbaumstraße 2, A-4600 Wels, Austria

Tel: +43 (0)7242 241-0, Fax: +43 (0)7242 241-3940

E-Mail: sales@fronius.com

www.fronius.com

www.fronius.com/addresses

Under <http://www.fronius.com/addresses> you will find all addresses
of our Sales & service partners and Locations.